AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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A CATTLE "ROUND-UP" IN COLORADO.—*Drawn and Engraved for the American Agriculturist.*

The stock business upon the Western plains is an exciting and busy occupation. As the cattle run at large upon the range, the herds of many proprietors necessarily become mixed together. It is therefore requisite for the owners to be constantly on the watch that the cattle may not stray too far, and that their general safety be looked after. A sort of co-operative mutual care is exercised over the combined herds; a sufficient number of bulls are kept on the range by each owner, in proportion to the number of cows he owns, and at certain seasons the cattle are gathered together at a stated place, that the stock of different owners . .y be separated, and the calves marked or branded. Every year there is what is known as a "Round-up." The owners of any one county or district are associated together, with a captain and subordinate officers, who make regulations and arrangements for the "Round-up." The time and place selected is advertised or published, or the parties interested are notified, and on the day appointed a large number of mounted men scour the country, and gather to the selected place all the scattered droves they can find in the neighborhood. These are driven and kept together in a close mass, as shown in the engraving. From out of this general herd the cattle are sorted according to the brands upon them, by which their owners can recognize them. Or as they are driven up, each man and his herders "cut out" or separate the stock owned by him, and drive them to a place by themselves. Here they are kept together by some herders, who, on their trained horses, and with long whips, prevent them from straying off. This is the "Round-up." The cattle are counted, those not marked are branded, those ready for market are driven off for sale, and the remainder are left to wander over the range until the next occasion. The branding or marking of the cattle is done by heated irons, made in the form of the inital letters of the owner's name, or a monogram which includes these letters. The animal to be branded being caught with a lasso, is held or thrown, and the brand, heated so as to mark the skin, is held upon the flank or shoulder, until a permanent scar is made. The brands are registered in the county clerk's office, and the mark is held to be an undisputed title to the ownership of the cattle. Cattle without brands are public property.

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Cheese Making.—"L. M. S.," Colfax, W. T., in the *American Agriculturist* of September, 1875, is an article on Cheese Making, giving the exact proportions of rennet to be used, and the method of preparing it.

Calendar for October.

Day of Month.	Day of Week.	Boston, N. England, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Mo'n sets.	N. Y. City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Mo'n sets.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Mo'n sets.
		H.M	H.M	H. M.	H.M	H.M	H. M.	H.M	H.M	H. M.
1	S	5 57	5 42	3 56	5 56	5 43	3 57	5 56	5 43	3 59
2	M	5 58	5 40	5 3	5 57	5 41	5 3	5 57	5 41	5 3
3	T	5 59	5 39	rises	5 58	5 40	rises	5 58	5 40	rises
4	W	6 1	5 37	5 57	6 0	5 38	6 1	5 59	5 38	6 4
5	T	6 2	5 36	6 26	6 1	5 37	6 31	6 0	5 37	6 36
6	F	6 3	5 34	7 4	6 2	5 35	7 10	6 1	5 35	7 16
7	S	6 4	5 32	7 49	6 3	5 33	7 56	6 2	5 34	8 4
8	S	6 5	5 31	8 46	6 4	5 32	8 56	6 3	5 32	9 2
9	M	6 6	5 29	9 51	6 5	5 30	10 1	6 4	5 31	10 8
10	T	6 8	5 27	11 12	6 6	5 28	11 18	6 5	5 29	11 24
11	W	6 9	5 26	morn	6 7	5 27	morn	6 6	5 28	morn
12	T	6 10	5 24	0 28	6 8	5 25	0 32	6 7	5 26	0 38
13	F	6 11	5 22	1 44	6 9	5 24	1 47	6 8	5 25	1 50
14	S	6 12	5 21	2 55	6 10	5 22	2 57	6 9	5 23	2 58
15	S	6 13	5 19	4 7	6 11	5 21	4 7	6 10	5 22	4 7
16	M	6 14	5 17	5 17	6 12	5 19	5 15	6 11	5 20	5 14
17	T	6 15	5 15	sets	6 13	5 17	sets	6 12	5 19	sets.
18	W	6 17	5 14	5 35	6 15	5 16	5 40	6 13	5 18	5 45
19	T	6 18	5 12	6 7	6 16	5 14	6 13	6 14	5 16	6 19
20	F	6 19	5 11	6 41	6 17	5 13	6 49	6 15	5 15	6 55
21	S	6 20	5 9	7 27	6 18	5 12	7 35	6 16	5 14	7 43
22	S	6 21	5 8	8 21	6 19	5 11	8 28	6 17	5 13	8 36
23	M	6 22	5 6	9 31	6 20	5 9	9 37	6 18	5 11	9 44
24	T	6 23	5 5	10 37	6 21	5 8	10 33	6 19	5 10	10 39
25	W	6 25	5 3	11 33	6 22	5 6	11 37	6 20	5 9	11 42
26	T	6 26	5 2	morn	6 23	5 5	morn	6 21	5 8	morn
27	F	6 27	5 0	0 37	6 24	5 3	0 40	6 22	5 6	0 43
28	S	6 28	4 59	1 40	6 25	5 2	1 42	6 23	5 5	1 44
29	S	6 29	4 57	2 44	6 26	5 0	2 45	6 24	5 3	2 45
30	M	6 30	4 55	3 51	6 27	4 59	3 51	6 25	5 2	3 50
31	T	6 32	4 54	4 57	6 29	4 58	4 55	6 26	5 1	4 53

PHASES OF THE MOON.

MOON.	D.	BOSTON. H. M.	N. YORK. H. M.	WASH'N. H. M.	CHA'STON H. M.	CHICAGO. H. M.
Full M'n	3	6 12 mo.	6 0 mo.	5 48 mo	5 36 mo.	5 6 mo.
3d Quart.	10	5 36 mo.	5 24 mo.	5 12 mo	5 0 mo.	4 30 mo.
New M'n	17	5 13 mo.	5 1 mo.	4 49 mo	4 37 mo.	4 7 mo.
1st Quart	25	8 10 mo.	2 58 mo.	2 46 mo	2 34 mo.	2 4 mo.

AMERICAN AGRICULTURIST.

NEW YORK, OCTOBER, 1876.

This month and the next are really two of the busiest months of the year. We are too apt to forget this, and to let the pleasant October days lure us to rest or pleasure seeking. Then come corn-husking and potato digging in the sleet and slush of the first wintry storms. We have never been caught so but once, and never will be so caught again. While anything remains to be done, there should be no "let up"; that which *may* be done, may be left, but that which *must* be done should be done now. There is corn yet to be cut up; potatoes to be dug; apples to be gathered; corn to husk; roots to harvest; stalks to be drawn in and stack; buildings to fix up, and stock to be looked after. The man who will leave any of this work, and go to digging out stone, making fences, wasting time at public sales or other gatherings, or lying around doing nothing, deserves to work in the snow with cold hands and feet, and have no pity. Let everything that must be done be noted down, and finished in order, and the rest be done when the most convenient time comes. But it is by no means lost time to attend the County or State Fair. This ought to be made a special business. And when there, remember it will pay better to study the machines, implements, products, and stock carefully, and attentively, than to run with the crowd to the horse races or the trotting ring. The annual fair should be made a business matter; every farmer, his wife, and children should have something to exhibit there, and should compare and judge for themselves all other exhibits. If no prize is gained, there should be no disappointment, vexation, or jealousy, but a determination to improve upon the effort next year, and if possible then to succeed.

Hints about Work.

Winter Grain, may yet be sown; on good warm soils wheat may succeed sown as late as the end of the month, and rye may be sown as late as early in November. Double the usual quantity of seed should be sown, to ensure a good growth. We have had an excellent and heavy growth of rye to cut in April for soiling, from a field sown in November with 5 bushels to the acre.

Top-Dressing the knolls or poorer parts of the newly sown wheat fields, will be found useful. A thin coating of straw even, has been found of great service, and has helped the crop wonderfully in some cases. For this purpose any coarse manure or straw may be used. Marsh hay or buckwheat straw will be serviceable, as, except when manure is used, the shelter and protection is what benefits the crop. Where the wheat has come up thin and poor on worn lands, 150 lbs. of the best guano, or 100 lbs. of nitrate of soda, per acre, will be beneficial. It should be used early to do the most good.

Water Furrows from low spots should be made at once, to carry off the water which will gather by and by. When these spots are flooded and the soil is wet, it will be too late to do this work, as the trampling of the ground will do more mischief than the water. This *should* be done at once.

Corn Husking.—The present season corn may be husked earlier than usual, and there need be none left in the field by the end of the month. As there are many things to be done during fine weather, it will generally be best to let out this job by the bushel. In this case keep an eye on the huskers, that the work may be done cleanly and no small ears left on the stalks. Large ears measure up more quickly than small ones, and are as easily husked, hence small ears are sometimes not husked. Have two baskets in the field, one for small ears, soft corn, and nubbins, and the other for large sound ears, which should be cribbed by themselves. The rest should be boiled for the pigs, or ground with some oats and bran for feed for cows, but never cribbed with good corn.

Seed Corn should be selected now for next season. Large, sound ears, filled to the tips, are preferable to smaller ones, although two may have grown upon one stalk. We would rather have one good ear upon each stalk, than two small ones upon half the crop, and one small one upon the rest. One large good ear upon a stalk, will yield over 200 bushels of ears per acre, and that ought to satisfy any man. The selected ears should not be husked, but the husks turned back and braided together, so as to make a bunch of 20 or 30 ears. These should be hung up in a dry safe place.

Corn Fodder.—Especial attention has recently been given to corn-fodder in the *American Agriculturist*. What has been said, and the contrivances that have been described should be studied. There will be a scarcity of fodder in many places in the East, and economy should be used in saving and feeding the stalks. They should be put under cover if possible, as they are rarely stacked so as to keep them dry. Mouldy stalks are often the cause of sickness amongst cattle, which is charged to "horn ail," or some other imaginary or obscure disease. Throw out all smutty stalks and burn them. They are not wholesome food, and the scattered smut will be very apt to infest the crops another year.

Potatoes.—We gather potatoes into a temporary pit, and cover the heap with a quantity of the stalks before we leave the field at night. We think this safest and best. They are not touched by a light frost that might occur, nor scalded by the noon sun. As soon as they are dry, gather into heaps of 40 or 50 bushels, and cover, when they will be safe until heavy frosts come, when they should be pitted, or stored in a dry cellar. It is best to dig only in dry weather. Potatoes are high now, on account of the ravages of the potato beetle and the dry weather, in some sections. But on the whole the crop is large, and prices *may* not keep up when the supply becomes diffused and equalized. This may be worth considering by those who can dig their crop early.

The Potato Fungus.—It is now known that the spores of the fungus which causes the potato disease, remain in the stalks or tubers during the winter. Where there is any disease, then it would be safe to burn the stalks, and pick out every diseased tuber to be boiled and fed to pigs or chickens. If this is done generally, the potato disease will probably never become very serious in this country. We have seen many diseased potatoes this season.

Live Stock.—With the new outlet for beef and mutton to the European markets, it is not probable that feeding good beeves will be unprofitable for some time to come. But none but the best stock

is suitable for shipment. It will be wise then to weed out all poor stock which costs as much to keep as the good, and keep only the best. Then these should be kept in the best manner. Just now is a good time to study over this matter and lay plans for the future. Good grades of all sorts of stock are without doubt the best kind of animals to have on any ordinary farm.

Cows.—As the feed out of doors falls off, something must be done for the cows. The leaves of root crops, or some roots, will be useful to keep up the flow of milk with cows that are still milking. But unless a special business is made of winter dairying, it will be well to have the cows dried off before the cold weather arrives. Frozen half-decayed green food is not healthful, and makes poor milk. It would be better to put the cows upon dry feed at once, than feed waste rubbish to them. Cows forward in calf should be kept in fairly good condition, and no more, for safety.

Calves and Yearlings.—Nothing pays so well as to keep young stock growing all the time. Good feed and good care are sure of a satisfactory reward. And now is the time to keep a sharp eye on the young animals and treat them generously.

Sheep.—Wool is low, but good mutton sheep still pay a good profit. The business of raising early lambs is likely to be always profitable. It is only where wool is the principal object that sheep keepers have reason to complain, and they even would be unwise to throw away their flocks because of a temporary depression in wool. It would be better to weed out the poor ewes and half-bred rams, procure full-blood rams, and grade up the flock. Then it will not only be easier to get through the hard times, but when the turn comes, as come it will, the profit will be the greater. See hints for last month.

Fall Plowing.—While hand-work presses, it will be wise to hire extra help to keep the teams at work plowing stubbles, drawing out and spreading manure on the sod intended for corn, hauling swamp muck, and doing other necessary work.

Labor can be procured cheaply now, and it is possible cheaper than for several years to come. Improvements that need to be made, drains, clearings, etc., may now be done at reasonable cost, and if any idle hands are around, they should be set to work as far as possible. In hiring men, give the preference to near-by residents rather than wanderers. It is to the farmers interest to encourage a steady supply of respectable laborers around him.

Roads.—Before the fall rains occur, roads should be repaired, holes should be filled up, hollows leveled, and what is most important of all, the drains should be cleared and put in good order. The surface of the road should be made smooth and sufficiently rounding to turn the water into the side drains, and these should not have so much declivity as to become washed by the current.

Wagons and other vehicles.—While wagons and carts are dry, they should be painted, or if that is inconvenient at this season, they should be put under cover when not in use, until they can be painted. A carriage should not be kept so near a stable that the pungent fumes of ammonia can reach the varnish. These deaden the varnish, and in time cause it to peel off; then the carriage builder is blamed for that for which he is not responsible.

Fuel.—The winter's fuel should now be laid in. Coal should be hauled and stored, and wood cut and split, and piled ready for hauling. Wood cut now, if split fine, will dry thoroughly by Christmas.

Work in the Horticultural Departments.

After the harvest is over, and the late crops of roots stored, there will still remain the work of preparing the ground for next year's crop. The severe drouth of the past season ought to be a warning to horticulturists to underdrain their land, and to make preparations for irrigation where it is possible. The first outlay for irrigating will be considerable, but the almost absolute certainty of good crops every season will make it a profitable investment. There should also be arrangements for storing in a convenient place all drainage from the house, waste water from the roofs of buildings, and all chamber slops and liquid manure; these, if applied to the small fruits, vegetables, grass, etc., will prove very valuable, and utilize what would otherwise prove a nuisance. The storing of roots for winter must not be done before the weather becomes moderately cool, else there will be danger of decay. A root cellar, separate from that of the house, should be provided for vegetables, to avoid the bad odors, if not danger of disease, which may come from vegetables stored in the house cellar.

Orchard and Nursery.

In all localities where the autumns are long and mild, it is decidedly better to plant trees, except stone fruits, in the fall. The soil is in better condition, and the work can be more thoroughly done than in the uncertain weather of spring. The trees should be set as soon as the free falling of the leaves shows that their duties are over; if set soon, the trees will become well established, or "get a good hold of the soil," as gardeners say, before winter sets in. Even if spring-planting is preferred, it is better to procure trees now and heel them in, to be in readiness for setting next spring; transportation is much safer at this season, and this plan will save much anxiety and hurry. A mound of earth a foot high, raised around each tree before the ground freezes, will serve better than a stake, and help protect it from mice. Prepare the land for spring planting.

Heeling-in.—There is a wrong and a right way with this. If a bundle of trees is dumped into a hole, with some earth thrown carelessly over the roots, probably the majority will be found dead in the spring. The right way is to open a wide trench 12 or 18 inches deep, place in the trees singly at an angle of 45° or more, and cover the roots of each with mellow soil, taking care to fill in around completely, leaving no spaces, and finish by banking up well, and provide a channel for the water to run off. The trees should lean towards the south, so that the branches will shade the trunks; if mice are troublesome, it is better to stand the trees upright, and bank the earth all around them. When heeling-in is well done, the trees will pass the winter as safely as if in the nursery, and they are at hand whenever planting can be done.

Seeds.—Prepare beds for sowing seeds of such fruit and ornamental trees as require to be sown at once, as many require the action of the frost to insure their germination. Seedlings from seeds sown last spring, may be taken up and heeled-in, to prevent injury from the heaving of the soil, or be well mulched with leaves.

Nursery Rows may be manured by opening a furrow between them, into which well rotted manure is put and covered. Turn light furrows towards the rows, to throw the water away from them.

Harvest the late apples and pears, and barrel them, but do not put them in the cellar until the weather becomes cold. This year much of the fruit must be examined and assorted before sending to market.

Drying of Fruits should be continued; where there is no drying apparatus, arrange racks near the kitchen stove to use in damp weather.

Shade Trees.—Most varieties of shade trees, except Evergreens, may be set out now, for the reasons given for fall-planting fruit trees. Don't forget to plant a "Centennial" tree.

Manure.—People are slowly learning that fruit can not be taken from the land year after year without making a return, and that unless the orchard is manured, it in time becomes nearly useless. Stable manure, ashes, lime, or bones, are all valuable, and may be applied now or in spring.

Fruit Garden.

The late varieties of pears, and grapes, and the quinces having been harvested, the main work now is to prepare for the next season's crop.

Pears.—Store in a cool room on shelves or in shallow boxes, not exposed to light, and consume or market as they ripen. The late sorts may be treated like winter apples; when they begin to soften bring them into a warmer room to finish.

Grapes.—Only a few varieties keep well, and are best kept by packing in 5-lb. boxes, after they have been picked a few days; keep at an uniform low temperature. After the fruit is gathered, the vines should be pruned before cold weather, and tender kinds laid down and covered with earth.

Strawberries.—If cultivated in rows, the runners should be kept cut off. Apply a dressing of well rotted manure between the rows. Set out plants for new beds in rich soil.

Currants and Gooseberries.—Prune by shortening the new wood, and thinning where too crowded; make cuttings of new wood, and cut into lengths of 6 or 8 in., and set out in rich soil 4 in. apart, with one bud above ground. Pack the earth close around the cuttings.

Blackberries and Raspberries do best when set in the fall, that they may get well established and commence growing early in the spring. Set blackberries in rows 8 ft. apart, and six feet in the rows. Raspberries need not be planted so far apart; four feet each way is a convenient distance.

Kitchen Garden.

Harvesting the remaining crops, and preparing for those of next season, will make this a busy month. Plow or spade all land intended for vegetables this fall, turning under a heavy coating of manure. It is not too late to drain, and it is not probable there will ever be a time when it can be done more cheaply, materials and labor being low.

Asparagus.—When growth has ceased, cut the tops and burn them, unless seeds are wanted for new beds. Apply a heavy dressing of manure, which should lie until spring.

Beans.—Gather all ripe beans. The ripe Limas are much superior to the common field bean for baking. Salt down the late crop of string beans.

Beets.—Pull before the frost has injured their sweetness. Pack those for table use in sand or dry earth, to keep them from shriveling. The tops are excellent for milch cows, and may be kept fresh several weeks at this season, if not put in large heaps.

Cabbages.—Leave the winter sorts in the ground until freezing weather is at hand; then take up and store in a cool cellar or in trenches in the open ground. If stored in the open ground, they may be stood upright in trenches, and covered with straw and boards when really cold weather comes; or they may be set on the surface, roots up, and then be gradually covered with earth as the weather becomes colder.

Cauliflowers.—Set any which are likely to head in a cellar or cold-frame.

Carrots.—Dig and store those for family use in dry earth or sand in the root cellar. Those for feeding out may be put in pits or trenches.

Celery.—Earth up gradually, taking care not to allow the earth to get into the heart of the plants.

Cold-Frames.—These should be made ready at once for the reception of cabbage and other plants which are to be wintered over.

Hot-Beds.—Prepare a supply of light rich earth for next spring, and store where it can be got at readily when needed.

Lettuce.—Sow in cold-frame for wintering over, and a few rows in the open ground; cover with hay or straw before freezing weather.

Onions sown in the fall require to be covered with bog hay or litter, to keep them from being thrown out by frost.

Parsnips.—Dig enough for winter use, and store in earth; the rest leave in the ground until spring.

Rhubarb.—Divide old plants and reset in fresh soil, which has been previously heavily manured. A root or two may be put in the cellar and then started in the hot-bed early.

Salsify and Scorzonera.—Treat same as parsnips.

Spinach.—Sow for spring use in rich soil, and keep that sown last month free from weeds.

Squashes.—Gather before heavy frosts and leave in heaps in the field a few days, covering with the vines at night. Use the greenest specimens first.

Sweet Potatoes.—Dig as soon as the frost has touched the tops of the vines, taking care not to bruise or cut them. Allow them to remain exposed to the sun for a day, and then store in barrels in a room where a warm even temperature can be had.

Tomatoes.—A few plants may be covered with mats, to protect them from the first frosts, and they will continue to bear for some time. Green ones are useful for chopped or other pickles. Make catsup if not already done.

Turnips may be left in the ground until hard frosts, when they must be pulled, topped and stored in bins in the root cellar. The rutabaga sorts are best for family use, especially the White French; pack these in earth, as directed for beets.

Dry Earth.—If a store has not been provided during the dry season, a spot should be harrowed often, to promote rapid drying. Scrape up a supply of dried earth for use in the stables and outbuildings. Store where it will keep quite dry.

Spading.—Spade up all spots which can not be plowed, so that the soil will be made fine by frosts.

Flower Garden and Lawn.

The present is a better time for laying out new walks, drives, and doing any such jobs, than the spring, when work is driving. After the plan is thoroughly made and all needed materials at hand, it will be comparatively easy to carry out the details.

Walks need thorough work, and to have the foundations well laid at the start; at least two feet of earth should be dug out and the space filled with stones to within six inches of the surface; then put on broken stone, and finally finish with good gravel; a walk or drive thus made will last, with the addition of a little gravel occasionally, for a lifetime. Always make the center sufficiently higher than the sides, to allow the water to run off quickly.

Bulbs.—This is the best month for putting in Hyacinths, Tulips and other spring flowering bulbs. Cover with coarse litter before severe weather sets in. Store tender bulbs, such as Tuberoses, Gladioluses, etc., in a dry place, where the mice will not injure them, carefully labelling the named sorts.

Dahlias.—Keep tied to stakes, and if covered cold nights with a cloth or even a paper, their bloom will often be prolonged for some weeks. After the tops are killed by frosts, leave the tubers in the ground for a few days, to ripen; dig on a sunny day, label, and take to the cellar, handling carefully, as they break readily.

Frames and Pits should be in readiness to receive all half hardy plants.

Peonies.—The best time to set these is in the fall, when they are in a state of rest; divide and reset in good garden soil.

Cannas should be taken up before the leaves are killed by frost and stored in a shed where they can dry for a week or so; finally store them where frost and dampness cannot injure them; a good place is under the benches in a greenhouse.

Hardy Herbaceous Perennials.—The fall is the best time to divide and re-set most of these, as many start so early in the spring that they cannot then be moved with safety. Hardy herbaceous perennials should, as a general thing, be moved and divided once in three years, to keep them at their best. When left longer, the roots get matted and the soil around them exhausted.

Seeds.—Sow seeds of shrubs and perennials in boxes, which may be set in cold frames.

Clematis may be raised from seeds which should be sown at once; if they fail to start next spring, they will be quite sure to grow the following one. Many very handsome varieties can be raised from seeds of good named sorts. Some native species are worth trying.

Bedding Plants.—Make cuttings of all to be saved over winter, as it is seldom worth the trouble to keep old plants, when new ones can be made so readily.

Greenhouse and Window Plants.

Everything should now be ready, so that there will be no delay in removing tender plants to the house or greenhouse whenever the weather shall render it necessary. The heating apparatus should be in order, else many plants might be lost by frost. Do all needed glazing and make everything tight.

Annuals.—Sow seeds of annuals for winter flowering now, and keep in a moderately cool place, so that the plants will be stocky and healthy.

Forcing Plants.—Where shrubs and herbaceous plants are forced for flowers, they should be taken up now and potted or planted in the cold frame or cellar, and then be brought into heat as required.

Insects.—Before bringing a plant into the greenhouse, see that those left there are free from insects, and then that all that are taken in are first thoroughly examined, and all insects removed.

Climbers.—Tie up climbers to the rafters or wires, and cut back the too rampant growers.

Bulbs.—Pot and put in a dark place all which are to be grown for winter flowering. After they have formed roots they must be brought into the greenhouse from time to time, as wanted.

Hanging Baskets.—Re-stock with such plants as are fitted for the purpose and let them stand a few days in the shade, until they become established, when they can be hung in the house or greenhouse.

Ferneries.—Remove the old plants, keeping only such as are worth saving, and plant ferns, selaginellas, and such as require a moist atmosphere. The ferns from the woods seldom do well in a case, as the fronds or leaves of most kinds die down to the ground on the approach of winter.

Window Gardening.—Plants that have been turned out into the borders, or those that have been plunged, should be taken up before cool nights check them too much, and placed on a veranda or other partially protected place. In potting, cut back all rampant growth. Observe the directions as to insects given for plants to be taken into the greenhouse—indeed nearly all in relation to the greenhouse is applicable to the window garden.

Commercial Matters—Market Prices.

Gold has been up to 111⅜, and down to 109⅝, closing Sep. 12, at 110, as against 111⅛ on Aug. 12, and 111⅞ on July 12....With advices from Europe, reporting a less satisfactory general result from the foreign harvests, than had been anticipated, and toward the close boisterous weather, reflected in the foreign markets, in the more confident demand for supplies and the firmer range of values,—our Breadstuff markets have been, as a rule, quoted stronger, especially toward the close, on a livelier business, in good part for export. Flour has been more freely dealt in and has advanced. Wheat has been in good request, but the meagre supplies available have been against active operations. Quite liberal purchases have been reported of new crop winter, to arrive, mainly of new crop amber and white Michigan, which closed more firmly. Corn fluctuated frequently, but closed in favor of sellers, on a brisk trade, chiefly for export. Rye has been more inquired for at a sharp rise in prices. New crop Western Rye, to arrive, has been quite freely purchased for shipment to Germany. Barley and Malt have been offered with reserve and have been quoted higher, but quiet. A free movement has been reported in Oats, value of which also improved....Provisions have been quite freely dealt in; hog products have been much lower; Butter, Cheese, and Eggs, dearer....Wool has met with a much readier sale to the manufacturing interest, and prices of desirable lots of domestic product have advanced decidedly, closing strong....Cotton has been quoted lower, on a moderately active movement....Tobacco has been in better request, for home use and export, at firm rates....Hay, Straw, Hops, and Naval Stores have been in fair demand....Petroleum has advanced materially, on reduced offering and an increased call for supplies from nearly all sources of inquiry.....Grass seeds have been in some demand, but at reduced figures. Timothy closed here at $1.70@$2.00; rough Flax, $1.43@$1.44; new Clover nominal at 10c. bid, and up to 15c. asked. New Clover has been sold at Philadelphia down to 10c. per ℔....Ocean grain freights have been fairly active, closing strong....Grain rates by steam to Liverpool, closed on the 12th Sep. at 8¼@8¾*d*; to Glasgow at 7¾@8¼*d*; to London at 8¼*d*; to Liverpool, by sail, at 7½*d*; London, by sail, at 7½@8*d*. per bushel. Provisions by steam to Liverpool, 40*s.*@55*s.* per ton; Cotton at 5/16@⅜*d.* ℔ ℔. Grain tonnage for Cork and orders, at 5*s.*10½*d.*@6*s.* per quarter. Grain rates from San Francisco to Liverpool, quoted at 55@65*s.*

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our daily record during the year, show at a glance the transactions for the month ending Sept. 12th, 1876, and for the corresponding month last year:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	294,000	1,617,000	4,117,000	221,000	31,000	693,000
26 d's *last* m'th	305,000	2,451,000	2,060,100	112,000	65,000	1,015,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	431,000	2,302,000	3,349,000	253,000	16,500	1,214,000
26 d's *last* m'th	412,000	2,634,000	2,107,000	39,000	—	1,104,000

2. *Comparison with same period at this time last year.*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 days 1876	294,000	1,617,000	4,117,000	221,000	31,000	693,000
28 days 1875	314,000	4,913,500	3,918,000	29,000	41,000	1,061,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 days 1876	431,000	2,302,000	3,349,000	253,000	16,500	1,214,000
28 days 1875	318,000	5,774,000	4,163,000	19,000	36,000	1,973,000

3. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
Sept. 11, 1876	2,532,944	935,136	60,281	52,891	889,136	445,316
Aug. 7, 1876	2,831,299	904,557	94,960	53,914	1,232,895	434,208
May 8, 1876	1,563,826	172,090	16,365	33,501	457,387	450,649
Apr. 10, 1876	3,393,074	232,140	68,429	200,381	706,282	436,942
Jan. 10, 1876	5,802,393	663,982	100,741	325,191	1,080,300	307,438
Dec. 7, 1875	5,878,036	816,962	99,908	305,961	1,252,005	258,364
May 11, 1875	969,804	1,542,924	16,124	16,537	545,209	229,655

4. *Exports from New York, Jan. 1, to Sept. 8.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Peas.* bush.
1876	1,337,000	18,679,000	11,877,000	682,000	28,000	433,360	460,200
1875	1,282,727	18,140,047	8,387,682	152,333	225	88,472	285,985
1874	1,529,415	24,462,895	15,829,600	533,050	3,320	86,886	272,105
1873	966,067	12,166,224	9,813,745	531,093	19,226	26,591	91,570

CURRENT WHOLESALE PRICES.

	Aug. 14.		Sept. 12.	
PRICE OF GOLD	111 1-2		110	
FLOUR—Super to Extra State	$3 65	@ 5 25	$3 85	@ 5 35
Super to Extra Southern	3 65	@ 8 50	3 85	@ 8 50
Extra Western	4 40	@ 9 25	4 60	@ 9 75
Extra Genesee	5 25	@ 6 50	5 35	@ 6 75
Superfine Western	3 65	@ 4 35	3 85	@ 4 50
RYE FLOUR	2 75	@ 5 15	2 90	@ 5 15
CORN-MEAL	2 60	@ 3 25	2 60	@ 3 30
WHEAT—All kinds of White	1 20	@ 1 35	1 18	@ 1 33
All kinds of Red and Amber	70	@ 1 30	90	@ 1 28
CORN—Yellow	57	@ 61	56	@ 58
Mixed	48	@ 58½	50	@ 57½
White	56	@ 63	54	@ 56
OATS—Western	26	@ 45	37	@ 48
State	39	@ 48	42	@ 50
RYE	60	@ 76	68	@ 90
BARLEY	Nominal.		85	@ 1 10
HAY—Bale, ₱ 100 ℔s	55	@ 95	60	@ 1 00
STRAW, ₱ 100 ℔s	45	@ 95	50	@ 95
COTTON—Middlings, ₱ ℔	12¾	@ 12¾	11¾	@ 11¾
HOPS—Crop of 1876, ₱ ℔	—	@ 30	20	@ 30
" old, ₱ ℔	4	@ 20	4	@ 20
FEATHERS—Live Geese, ₱ ℔	30	@ 60	30	@ 60
SEED—Clover, ₱ ℔	16	@ 10¾	10	@ 11
Timothy, ₱ bushel	2 75	@ 2 90	1 70	@ 2 00
Flax, ₱ bushel	1 40	@ 1 42½	1 43	@ 1 44
SUGAR—Refi'g & Grocery ₱ ℔	7¼	@ 10¾	8	@ 10¾
MOLASSES, Cuba, ₱ gal	30	@ 42	30	@ 40
New Orleans, new crop, ₱ gal	47½	@ 60	45	@ 60
COFFEE—Rio (Gold)	14¾	@ 17¾	15¾	@ 18¾
TOBACCO, Kentucky, &c., ₱ ℔	6	@ 25	5	@ 25
Seed Leaf, ₱ ℔	5	@ 25	5	@ 25
WOOL—Domestic Fleece, ₱ ℔	38	@ 40	20	@ 45
Domestic, pulled, ₱ ℔	16	@ 35	17	@ 38
California, clip	10	@ 25	12	@ 30
TALLOW, ₱ ℔	8¾	@ 8¾	8⅝	@ 8¾
OIL-CAKE—₱ ton	$38 00	@39 50	$38 50	@ —
PORK—Mess, ₱ barrel	—	@19 40	17 50	@17 75
Prime, ₱ barrel	—	@ —	15 50	@16 75
BEEF—Plain mess	9 00	@11 00	8 00	@10 00
LARD, in trcs. & bbls, ₱ 100 ℔	11 00	@11 15	11 15	@11 25
BUTTER—State, ₱ ℔	16	@ 30	18	@ 33
Western, poor to fancy, ₱ ℔	14	@ 27	16	@ 30
CHEESE	3	@ 9¾	5	@ 12
BEANS—₱ bushel	50	@ 1 50	75	@ 2 00
PEAS—Canada, in bond, ₱ bu	96	@ 98	93	@ 93
EGGS—Fresh, ₱ dozen	15	@ 20¼	20	@ 26
POULTRY—Fowls	12	@ 16	14	@ 19
Turkeys—₱ ℔	13	@ 17	15	@ 20
Geese, ₱ pair	1 25	@ 1 75	1 25	@ 2 50
Ducks, ₱ pair	56	@ 1 00	60	@ 1 00
Roosters, ₱ ℔	—	@ —	8	@ 10
Chickens, dry pick'd ₱ ℔	16	@ 25	15	@ 22
GROUSE, ₱ pair	—	@ —	80	@ 95
SNIPE, per doz	—	@ —	1 25	@ 1 50
PARTRIDGE, ₱ doz	—	@ —	85	@ 1 00
PLOVER, ₱ doz	—	@ —	1 37½	@ 1 75
DUCKS, Wild, ₱ pair	—	@ —	25	@ 65
WOODCOCK, ₱ pair	75	@ 90	80	@ 90
PIGEONS, wild, ₱ dozen	—	@ —	—	@ —
" tame, ₱ dozen	1 00	@ 1 25	1 25	@ 1 75
CUCUMBERS, ₱ bbl	—	@ —	50	@ 1 00
TURNIPS ₱ bbl	2 00	@ 2 50	1 00	@ 2 50
CABBAGES—₱ 100	5 00	@ 8 00	3 00	@ 8 00
ONIONS—₱ bbl	2 50	@ 3 00	1 25	@ 2 50
POTATOES—₱ bbl	2 00	@ 3 50	1 50	@ 2 75
SWEET POTATOES—₱ bbl	3 00	@ 6 00	2 75	@ 3 75
RADISHES, ₱ 100 bunches	—	@ —	50	@ 1 00
LIMA BEANS, ₱ brg	—	@ —	75	@ 1 75
STRING BEANS, ₱ bag	—	@ —	50	@ 1 00
CAULIFLOWER, ₱ doz	—	@ —	75	@ 5 00
BROOM-CORN	3	@ 9	3	@ 9
WATERMELONS, ₱ 100	15 00	@30 00	5 00	@20 00
GREEN PEAS, ₱ bushel	1 00	@ 1 15	1 00	@ 1 15
TOMATOES, ₱ bskt	87½	@ 1 25	50	@ 1 00
BEETS, ₱ 100 bunches	2 50	@ 3 00	2 00	@ 3 00
EGG PLANTS, ₱ doz	90	@ 1 25	75	@ 1 25
GREEN CORN, ₱ 100	75	@ 1 00	75	@ 1 25
NUTMEG MELONS, ₱ bbl	2 00	@ 2 50	2 00	@ 3 50
APPLES—₱ barrel	75	@ 2 00	75	@ 2 00
SQUASH, ₱ bbl	2 00	@ 3 00	50	@ 1 00
PEARS, ₱ bbl	1 50	@ 5 00	1 75	@10 00
PEACHES, ₱ basket	25	@ 2 00	50	@ 1 75
PLUMS, ₱ bbl	3 00	@ 5 00	5 00	@11 00
GRAPES, ₱ ℔	6	@ 9	3	@ 9
WHORTLEBERRIES, ₱ bush	75	@ 1 50	1 50	@ 2 50
MAPLE SUGAR, ₱ ℔	—	@ —	—	@ —
MAPLE SYRUP, ₱ gallon	—	@ —	—	@ —

New York Live-Stock Markets.

RECEIPTS. WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*	*Tot'l*
Aug. 21	9,016	58	3,510	25,856	18,586	57,226
Aug. 28	9,999	76	3,564	29,356	17,663	60,658
Sept. 4	8,896	22	3,997	24,442	18,785	56,142
Sept. 11	10,875	76	3,660	30,756	22,869	68,236
Total for 4 Weeks	38,786	232	14,731	110,410	88,123	242,262
do. *for prev. 5 Weeks*	49,347	503	15,861	141,621	100,798	308,140
	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*	
Average per Week	9,696	58	3,682	27,602	22,030	
do. do. *last Month*	9,871	100	3,172	28,824	20,159	
do. do. *prev's Month*	8,732	58	3,144	23,980	19,896	

Beeves.—The business for the past month has been

somewhat changeable, without resulting in any gain, although a better feeling is manifest towards the close of our report. The advance marked in our quotations, has been gained from an improvement in quality, and the absence of the lowest grades, rather than from a higher salable value. A very important element in the market just now, is the increasing shipment of the best cattle to Europe. Three shippers are now in the business, one of whom has 17 steamers fitted up with refrigerators. In 11 months nearly 9,000 cattle have been sent out, and as the foreign market is only limited by the means for successful carriage and our supply, cattle producers should note this new feature of the trade. The market closes with a break in prices on poor grades, Texans selling at 7@8¼c. ℔ lb., on stock estimated at 54 to 56 lbs. dressed per 112 lbs. live weight, against 9c. for the previous week; native steers were sold at 10½c. ℔ 57 lbs. to the cwt., and the large sales at these prices look bad for future business.

The prices for the past four weeks were as follows:

WEEK ENDING	*Range.*	*Large Sales.*	*Aver.*
Aug. 21.....	6¾@10½c.	7¼@ 9¾c.	9¼c.
Aug. 28.....	7¾@10½c.	7¾@ 9¾c.	9¼c.
Sept. 4.....	7¾@10½c.	9 @10¾c.	9½c.
Sept. 11.....	7 @11 c.	7¼@10¾c.	9½c.

Cows.—To sell cows has been difficult work until the small receipts of the third week of the month, and advance in beef improved the demand. Prices are only steady at $40 for poor, to $75 for fine, averaging $50 to $65 per head.....**Calves.**—The demand from farmers for good calves for feeding, has helped the market, and prices are firm. One good lot of blooded calves sold at $15 each to a farmer. Veals sold at the close at 7½@9½c. ℔ lb., live weight. Grass calves are in demand to go into the country, at 3½ @ 4½c. ℔ lb. or $6.50 to $11 per head....**Sheep and Lambs** now go together, and many lambs have been purchased by farmers for stockers, at 4c. ℔ lb. This is a bottom price, and being reached, affairs mended. Fat sheep were selling at the close at 5¾c., and of extra at 6c. ℔ lb. live weight, others sold from 5¼ down to 4c. ℔ lb., for very poor lots. The best lambs brought 7c. ℔ lb., Ohio lambs 5¼ @ 5½c. ℔ lb.... **Swine.**—The market has been up and down through the month, closing at 7½ @ 7¾c. for heavy dressed; 8 @ 8¼c. ℔ lb. for medium, and 8¾c. ℔ lb. for light, 160 lbs. and down. Live Ohios of 183 lbs. sold for $6.70 ℔ 100 lbs., and live State hogs brought 6½c. ℔ lb.

Prices of Feed.

Bran, per ton	$18.00@$20.00
Middlings, per ton	19.00@ 21.00
Ground Feed, per ton	15.00@ 21.00
Linseed-oil-cake, western, per ton	41.00@ 47.00
Cotton-seed-cake, per ton	25.?@ 40.00
Chandler's Scraps, per lb	3@ 4

Prices of Fertilizers.

No. 1. Peruv. Guano 10 p. ct. ammonia, standard, ℔ ton	$56.50
do. do. guaranteed, ℔ ton	56.00
do do. rectified, per ton	61.50
Mapes' Nitrogenized Superphosphate, per ton	45.00@ 50.00
" Plain Superphosphate (mineral), per ton	30.00@ 35.00
" Bone Superphosphate, per ton	40.00@ 45.00
" Prepared Fish Guano, per ton	35.00@ 40.00
Quinnipiac Fertilizer Co's. Phosphate, per ton	40.00
" " Dry ground Fish Guano, ton	45.00
" " Pine Island Guano, per ton	45.00
Fish Guano (crude in barrels), per ton	24.00
Bone Black, per ton	25.00@ 28.00
Bone Flour, per ton	40.00@ 45.00
Rawbones Ground (pure), per ton	33.00@ 40.00
Rough Bones, per ton	22.00@ 25.00
German Potash Salts, (25@35 per cent), per ton	20.00@ 25.00
Gypsum, Nova Scotia, ground, per ton	8.00@ 9.00
" In barrels, per bbl	1.25
Wood Ashes, per bushel	16 c.@18 c.
Nitrate of Potash (95 per cent.), per lb	8¼c.@ 9 c.
Chloride of Potass, (muriate of potash, 80p.c.), lb	2¾c.@ 3¼c.
Nitrate of Soda, per lb	4 c.@ 4½c.
Sulphate of Ammonia (25 per cent.), per lb	5 c.@ 5½c.
Dried Blood or Dried Meat per unit of ammonia	$3.00@ $ 4.00

The Centennial—One More Month.

There remains all the glorious month of October and about 10 days in November before the closing of the greatest exhibition the world has ever seen. We hardly know how to say more, than we have already said, to induce all who can possibly manage to do so, to visit this wonderful exhibition. It is really worthy of any sacrifice that one may properly make to compass the means of visiting it. In extent it is overwhelming, in artistic beauty it has been surpassed by European exhibitions, but in instructiveness, in interest for all—no matter what ones tastes, it is very far the greatest "World's Fair," yet held. The American portion would be naturally the strongest in machinery, and it is certain that such a gathering of devices, in which iron, informed by ingenious brains, is made to do the work of hands, was never before known. Such another assemblage of machinery at work (and machine products), as are now congregated *in* the acres of the Machinery Building, and worked by the miles of shafting all moved by the famed Corliss engine—itself an exhibition—is scarcely possible in any other part of the world, and will not be seen in this country during the life time of most of us. Then there is the farm machinery in the Agricultural Building, equally extensive in its way, and presenting objects for many days study. Then the Main Building will give a careful observer a better idea of the products and manufactures of the whole world, than many get in a journey abroad, and though there is much rubbish in the two immense Art galleries, there is still much that is of great interest. The Horticultural, the Dairy and the Government Buildings have already been noticed; besides there are the Mineral, the Shoe and Leather, the Carriage, the Wagon and many other buildings, which, though called "Annexes," are exhibitions of themselves. One can spend a day satisfactorily in visiting the various State buildings, some of which, like Kansas and Colorado, Arkansas and West Virginia, have each collections of more interest than one often finds at a County or State Fair. The writer, after his fourth visit of from 3 to 10 days each, finds that at each visit the immensity and excellence of of the exhibition grows upon him. While feeling that no one can say that he has thoroughly seen the *whole*, not if he began on the first and staid until the last day, we are sure, that every one who can possibly manage to visit the exhibition, whether for one week or more, or if unable to manage that, gives only three days to it, will feel amply repaid—repaid not only in the instruction he may receive, but in the feeling of pride that he is an American citizen, in the 19th century of the world's history, and at the end of the first century of his country's history. We would repeat that the expense of living in Philadelphia is not large. We know of those who found good board and rooms for $8, or $10 a week, and we have had letters from private individuals offering to furnish lodging, breakfast and 6 o'clock dinner for $1.50 a day. One accustomed to look out for himself in a strange place will have no difficulty in finding comfortable quarters. Go to the exhibition even at some sacrifice—it is an investment that will make large returns.

containing a great variety of Items, inc'uding many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

☞ **N.B.—The New Postage Law.**—On account of the new postal law, **which requires pre-payment of postage by the publishers,** each subscriber must remit, in addition to the regular rates, **ten cents for prepayment of yearly postage by the Publishers, at New York.** Every subscriber, whether coming singly, or in clubs at club rates, will be particular to send to this office postage as above, *with his subscription.* Subscribers in British America will continue to send postage as heretofore, for pre-payment here.

Remitting Money: — Checks on New York City Banks or Bankers are best for large sums; make payable to the order of **Orange Judd Company. Post-Office Money Orders** for $50 or less, are cheap and safe also. When these are not obtainable, **register** letters, affixing stamps for postage and registry; put in the money and seal the letter in the presence of the postmaster, and *take his receipt for it.* Money sent in the above three methods is safe against loss.

Bound Copies of Volume Thirty-four are now ready. Price, $2, at our office; or $2.50 each, if sent by mail. Any of the last nineteen volumes (16 to 34) will also be forwarded at same price. Sets of numbers sent to our office will be neatly bound in our regular style, at 75 cents per vol. (50 cents extra, if returned by mail.) Missing numbers supplied at 12 cents each.

Speak a Word for the German American Agriculturist.—For 17 years past an edition of this journal has been issued in the German language for the benefit of the large number of our citizens who read only the language of Vaterland. It contains the engravings and all the principal reading of the English edition. Several pages devoted to the advertisements in the English edition, are in the German edition occupied by a special extra Department, edited by the Hon. Frederick Münch, a distinguished cultivator of Missouri, which gives it additional value to the German reader. The colored cover only is omitted from the German edition. Many of our subscribers take the German copy for their gardener or their workmen. Will our friends make this edition known to their German friends and neighbors? Having the advantage of the engravings of the English edition, it is larger, better, and cheaper, than it could be if published independently. Both editions are issued on the same terms, and clubs may consist of either edition, or a part of both.

Death of Hon. Henry S. Randall, L.L.D.—This gentleman, so thoroughly identified with the wool-interests of the country, and President of the National Wool Growers' Association, died on August 14th, last, at his residence at Cortland, N. Y. He was at one time Secretary of State of New York, and occupied other public positions, and was the author of an excellent Life of Jefferson. He was best known to the agricultural community as an author on sheep husbandry, his works upon the Merinos being standard authorities for that breed. He was for a long time an associate editor of the Rural New Yorker.

☞ Subscribe **this month for all of 1877,** and get **November and December** Numbers FREE.

Silk in Kansas.—Some months ago we noticed a pamphlet on silk culture by Mr. L. S. Crozier, of Silkville, Ks. Mr. C. has recently sent us specimens of the cocoons and silk of his production, showing his success in that branch of industry, and, which interested us still more—specimens of several new varieties of the Mulberry, some of which have remarkably large leaves.

A Very Good Home School for Young Ladies and Girls.—Parents and guardians having Daughters or wards whom they wish to place where they will have all the care and kindness of a judicious and well regulated home, with sound, not fanciful or flimsy education, can find just such advantages by entrusting them to the care of Miss M. Macgregor, of Flushing, N. Y. This is a beautiful village, seven miles east of New York city, with such connections by railway as to give its residents all the advantages, day and evening, of lectures, museums, etc., that are enjoyed by city residents. Having had four children under Miss Macgregor's care at different times, within ten years past, we speak from personal experience and observation, in commending her as one of the best teachers we have ever known. She receives into her house eight or ten pupils who are taught in her day school with others, and out of school hours receive all the kind christian care from herself and her associate, Miss Quinby, that any one can possibly have when away anywhere from their own home. O. J.

Rice's Spring Braces.—In the usual mode of using elliptic (steel) springs on wagons, buggies, and other vehicles, there is a severe lever strain upon their narrow attachments to the axle, and the spring-bar above—especially in going up and down hills, and in starting and stopping, C. L. Rice, of Scranton, Pa., has devised a steel-bar to extend from the rear spring to the reach, which seems to be well adapted to relieve and prevent this strain. It is attached to the spring by a curve, so as not to impede the free perpendicular action of the spring, while it braces it against sudden back or forward movements. It is not expensive. Further particulars may be found in the advertising columns.

Bulletins of the Bussey Institution, in which are recorded the experiments and investigations made at that Department of Harvard University, will not be distributed gratuitously as heretofore. Five "Bulletins," constituting Vol. 1, and containing 25 separate papers have been issued and distributed. That the efficiency of the Institution, as an Experiment Station, may not be impaired by the expenditure of its funds in publishing and distributing future Bulletins gratuitously, it has been determined to issue them at the price of 75 cents per part of 80 to 100 pages. The Bulletin will in future be published by John Allyn, 30 Franklin street, Boston, who will receive subscriptions. The parts already issued can be procured from the publisher for 75 cents each; they contain matter of great value to the scientific farmer and horticulturist, and as the record of original investigations their value will yearly increase.

Grater for Apples and Cider Press.—"J. W. W.," Framingham, Mass.—An excellent grater for apples is one made by the Boomer & Boschert Press Company, of Syracuse, N. Y. A very powerful press is made by the same parties on the principle of the toggle or elbow joint, worked by a screw, by which great pressure is exerted by a comparatively small power.

The Georgia State Horticultural Society.—We have on more than one occasion referred to the activity of the people of Georgia in agriculture and rural matters generally. A recent manifestation of this is seen in the formation of a State Horticultural Society, which held its meeting for organization at Macon, Ga., on Aug. 15th, last. A report of the meeting shows that the most eminent horticulturists of the State were present, and the new society did much to insure its success by electing our friend P. J. Berckmans, of Augusta,

its first President. Mr. B., upon taking the chair, gave an address in which, among other matters, he cited the remarkable adaptability of the State to fruit growing; from the borders of Florida to the high mountains, it presents a wonderful diversity of climate, and allows of the production of northern as well as peculiarly southern fruits, and its capabilities in the way of vegetable and ornamental plants, are equally great. Every horticulturist will join with us in wishing prosperity to the new society.

Rifle Shooting "Counting."—As there is now a good deal of interest in rifle shooting, and the newspapers are full of "scores" made, etc., some of our readers wish us to tell them how the "counting up" is reported, to complete the full information given in our illustrated article last December. There are two kinds of targets generally used, Fig. **1** for 500 to 1,000 yards or more. This has a black center, 36 inches in diameter, though it looks like a small black spot at a distance of 1,000 yards (3,000 feet). Balls hitting this center count **5.** A white circle is around this, 9 inches wide, or 54 inches in diameter, in which shots count **4,** and are called "centers." The inner square is 6 feet each way. Shots in this, outside of the circle, are called "inners," and count **3.** The two wings are 3 feet wide, and 6 feet high. Shots in these count **2,** and are called "outers." There are no **1** counts....The 200-yard target, Fig. 2, is 4 feet wide, and 6 feet high. The black bull's eye, 8 inches in diameter, counts **5.** The circle around it, 26 inches in diameter, called "centers," counts **4.** The next circle, 46 inches in diameter, counts **3,** called "inners." Shots in the target outside of the circles, count **2,** called "outers."

Fig. 1.

Fig. 2.

American Dairying.—A work on American Dairying by L. B. Arnold, Secretary of the American Dairymen's Association, has been published by the Rural Home Company. As might have been expected from the reputation of the author, this book treats of the dairy business in a very practical and plain manner. If the author had omitted the chapter in which he advances some questionable theories of the "Animal odor" of milk and some curious speculations about the relation of "germs" to milk, the book would have been unobjectionable. This, however, is the only portion of the book that is not of practical utility to an American dairyman or woman. Sent from this office by mail for $1.50.

Artificial Mother.—"F. R. Q.," White Plains, N. Y. The artificial mother for young chickens described in the *American Agriculturist* for August is not, so far as we know, made for sale. It is so simple in construction that any one who can use carpenter's tools should be able to make one. Any worker in tin plate can make the heater.

Fine Balsams.—Those who have seen only the common kinds of half-double Balsams,—or "Touch-me-nots," as they used to be called—have no idea of the beauty of some of the improved strains. We thought we had seen quite perfect ones, but Mr. W. S. Allen, of Queens, L. I., recently showed us some that excelled any we had before seen. A white one, particularly, was very large, as full as the most double camellia, and of excellent substance, which makes it very useful for florists' work. Mr. A., who cultivates these Balsams in large quantities for their seed, informs us that the finest flowers so rarely produce seeds, that they are worth a cent a piece at wholesale.

"Signal Service Barometer."—"C. W. G." and several others, The article advertised under this name, is not a "barometer" at all, nor is it anything of the kind used in the U. S. Signal Service. According to the circular it is only the old storm-glass that has been around as long as we can recollect—and that is no brief period. Now that the thing has started up anew, we have made one, and if, after observing it a while, we think advisable, we will give directions, so that those who care to do so, may amuse themselves with it.

The Markrud Wagon Brake.—A committee appointed by the Elmira Farmers' Club has tested the Markrud wagon brake, recently described in the *American Agriculturist,* and has reported very favorable concerning it.

Coco or Nut-grass.—In response to our inquiry as to the methods of subduing this pest of the southern fields, "F. G. S." writes from Robertson Co., Tex., that sowing the land with cow-peas, *thickly* for two years in succession, will both destroy the "coco," and give a fine crop of cow-pea hay. This remedy is founded upon correct principles, and we do not doubt its success; crowding and smothering an objectionable plant by a useful one is one of the best methods of getting rid of weeds.

A Cranberry Weed.—"A. J. A.," Blackstone, Mass., sends a specimen to be named, of a plant which proves quite troublesome in cranberry meadows. It is known as Swamp-Loosestrife, Swamp Willow-herb, and Slink-weed, the last name on account of its reputation, in some parts of the country, as a cause of abortion in cattle. Its botanical name is *Nesæa verticillata,* a shrub with willow-like leaves in the axils of which are clusters of rose-colored flowers; the slender stems, 2 to 8 feet long, curve over and take root at the tips, after the manner of a black-cap raspberry, and thus spread rapidly, completely occupying the soil to the exclusion of other plants. We should judge that frequent mowing would keep it in subjection.

Screw Stump Pullers.—"A. C.," New Haven, Mo. A screw stump puller is made by Chamberlin & Sons, of Olean, N. Y.

Vergalieu Pear.—"S." writes from Hartford, Conn., that having a Vergalieu or White Doyenne pear tree, upon which the fruit, as in most Eastern localities, became cracked and worthless, he grafted over the tree and changed it into Bartlett. By an oversight a shoot of the original Vergalieu, which, being small, was mistaken for a graft was left. In time this twig became a bearing branch, and now yields an annual crop of perfect Vergalieu pears. Our correspondent thinks that this change for the better, on the part of this Vergalieu branch may be due to fertilizing its flowers with pollen from the healthy Bartletts. We regard the change as due to the new vigor imparted to the old trunk through the influence of the healthy leaves of the Bartlett; that we need not look to the pollen as the cause is shown by the fact that many an old Vergalieu has been restored by pruning and fertilizing, and made to bear good fruit.

Whale Oil Soap.—A Boston subscriber writes to know if this soap used upon vines will stain the faced brick walls. We have no experience meeting the case, but if the rains have free access to the walls we think they would wash them clean. Whale oil soap is dirty stuff. Who can tell if it will be safe to use it?

Thrush in the Feet.—"T. S. C.," Seekonk, Mass. The usual treatment for thrush is to pare away all the lose horn around the frog, and inject into the cracks a strong solution of chloride of zinc, washing out the diseased parts thoroughly. Then fill the crack with some tow, steeped in the solution to prevent dirt from entering the hoof. Where the heels have been cut away too much, use a Goodenough shoe.

Breaking up a Meadow.—"B. Bros.," Linn county, Mo. Meadows after a few years are apt to run to stools, unless some fresh seed is sown upon them every year and a top-dressing of some fertilizer, such as wood ashes, is given. When this has been neglected and the meadow is very "patchy," it would be better to plow it up and re-seed it. If this is not convenient, we would harrow the ground well, and sow some fresh seed at once and give a dressing of wood ashes after the seeding. In the spring, when the ground is still soft, the meadow should be well rolled. A dressing of barn-yard manure—that from horses fed upon grain and hay is generally free from weeds—would be useful once in four or five years.

Potash Salts for Wheat.—"W. W," Richmond Co., Va. Potash salts and all other very soluble fertilizers should either be used very early in the fall or in the spring. It would perhaps be safest to use half the quantity to be applied at once and the remainder in the spring. When the winter is mild and the crop is kept in a growing condition all the season, this rule is not intended to apply.

How to Whitewash a Poultry House.—"S. J.," Chatham Center, N. Y., writes, "my way of whitewashing a poultry-house is as follows: first make double the quantity required to do the work in the ordinary way; place the whitewash in a tub or barrel near your hen-house door, then apply the wash with a garden-engine or a hydropult, with a boy to assist, and the house can be done in fifteen minutes."

A Record of Grade Essex Pigs.—"J. W. D.," Jefferson Co., Iowa, sends the following account of the feeding and growth of two litters of grade Essex pigs, by a neighbor, Mr. S. H. Brown. There were 13 pigs experimented with, which came Oct. 28th, 1875. They had plenty of exercise, were fed upon corn and milk, had a comfortable place to sleep in, and plenty of dry bedding. April 18th, '76, they weighed 2,090 lbs—in 35 days from this time, until June 3d, they ate 49 bushels and 38 lbs. of corn, shelled and fed dry, (56 lbs. to the bushel,) and 1½ bushel wheat bran; they also received 4 gallons per day of skimmed milk. June 3d, when 7 mos. and 6 days old, their fasted live weight was 2,744 lbs., or an average of 211 lbs., showing a gain of 654 lbs. They were watered regularly three times a day. The milk was fed morning and evening after the corn. The mothers of the pigs are medium sized, from a Magie sow and a Berkshire boar. The sire is a thorough-bred Essex. On June 3d, one of the heaviest weighed 234 lbs.

Feeding decayed Fruit and Potatoes.—"G. O.," Hamilton, N. Y. If partially rotted apples or potatoes are boiled, they may then be fed to pigs without injury; but not otherwise without danger

Sundry Humbugs.

"A reader" seems to think that we give more attention to the minor swindles than we do to the large ones, and we admit that we have intentionally done so. The small frauds which have for their object the fleecing of their victims of all the way from a post-stamp up to $1 and $5 are much more numerous than those in which the game is played for larger sums, and in the aggregate these 50 cent and $1 humbugs fleece the community out of vastly more than do those in which $100 and $1,000 are involved. These minor cheats appeal largely to young people, and to persons of small means, to whom the loss of a dollar is of greater importance than the loss of the larger sums to those able to invest in them. If one has $100 ready cash to put into the hands of some curb-stone broker on Wall street, of whom he only knows through an advertisement, we do not feel a tithe the regret over his loss that we do over the farmer's boy or clerk in the village store who sends his dollar for some kind of a watch chain "which can not be distinguished from and will wear as good as gold." The possession of large sums implies a certain amount of ability in making the money, or caution in saving it, which make us feel that they who have them should know better than to be caught by sharpers, and feeling that such should less need our warnings, we have given more attention to the other class. Still there are cases in which those who have several hundred dollars to expend in a legitimate way—not in speculation with a view to rapid money-making—who are liable to be defrauded. An example of this is in the

PURCHASE OF BOGUS PIANOS.

Many a farmer or mechanic would gladly make his home pleasant by encouraging his children in a love for music, and many such have looked forward to the time when the money, perhaps the gradual accumulations of several years put aside for the purpose, could be invested in a piano. As he expects to buy but one piano in his lifetime, he intends it shall be a good one, and does not mind paying a good price for a good instrument. He has read about the different makers and what is said of their productions, and makes up his mind that he will have a Steinway, a Chickering, a Steck & Co., or a Decker & Bros., piano, each and all bearing a good reputation. If the intending purchaser goes to the nearest city and buys a piano as he would a barrel of flour, on the credit of the maker's name, it is about an even chance that he will get a bogus instrument, and one which, instead of lasting a lifetime, will be quite useless at the end of a year. A first-class piano is made with almost as much care as a ship is built, and the best materials in every part are put together with the greatest care and skill. The making of bogus pianos is a large and profitable business, as only the poorest materials are used, and though they are highly finished on the exterior, they are within a sham, and endure neither use nor atmospheric changes. The purchaser may say that he bought it on the strength of the maker's name, but a careful examination of the letters, often obscured by flourishes, will show that he has a *Steinmay* instead of a Steinway; a *Chickring* for a Chickering, and *Stock & Co.*, or *Becker & Bros.* were hurriedly read as Steck & Co. or Decker & Bros. Frauds like these are frequently exposed in the courts of New York city, for the makers whose names are thus imitated, finding their business injured, are bringing the sellers of such bogus instruments into court. No doubt these imitation pianos are

to be found in almost every city and considerable town, and it is known that they have been largely sold by traveling salesmen in the rural portions of the South and West. One intending to procure a first-class piano will do well to consult our "Premium List," and see what facilities are there offered; if the purchase is to be made outright, too much caution can not be exercised. It is better to deal at headquarters, even at a distance, as the freight on an instrument—if genuine, has to be paid from the factory, by some one—or if it is proposed to purchase of an agent, in this day of fast mails, it will take but a few days to learn by writing to the maker if the alleged agent is an authorized one....Be cautious, not only as to pianos, but those other musical instruments

MOWERS AND REAPERS,

and other agricultural implements and machines. Last month we gave on p. 354, under the title of

"VERY LIKE A SWINDLE,"

a brief account of some operations in Connecticut, which have caused a number of farmers no little trouble and anxiety. The plan is sufficiently set forth in the article referred to, the special point being that farmers were induced to act as agents for a so-called "Agricultural Works" in New Hampshire; implements were to be sent, the company agreeing to take back all not sold at a given time, and pay all expenses; but to make matters all straight, the agent is asked to give a note, payable at some distant time when it is supposed that the goods will be sold, and if they are not, why the farmer-agent has the agreement of the company to take them off of his hands. Strange to say, there were found even in this reputed the cutest of Yankee States, between twenty and thirty men who have acknowledged that they were foolish enough to give their notes. How many gave them and had rather "pocket their loss" than admit they have been swindled, we shall probably never know. The "Works," as soon as they got possession of the notes, immediately turned them into cash, for being from responsible farmers there was no difficulty in doing this. It is what the signers of the notes might have known that the holders would do. Now what did these note-giving farmers do?—Write and ask us to expose the "Agricultural Works" in our Humbug column, requesting us not to give their names? Not a bit of it! They did the manly thing, one which quite atones for their short-sightedness in giving the notes. The sufferers held a meeting and resolved to help one another, and among other things said as follows: "Whereas," so-and-so (giving the names of the men active in the matter) "have, by false and fraudulent representations and by certain dishonest and grossly deceitful practices, obtained from the individual members of this meeting certain writings, notes, and agreements, constituting one of the most barefaced swindles that was ever practiced upon the farming communities of this State; now, therefore,

Resolved, That we, individually and collectively, to the utmost of our means, power and ability, will resist and defend to the court of last resort, any suit or suits at law or otherwise brought against us, or any of us, by any person, firm or corporation, for or on account of any of said notes, writings or agreements.

"*Resolved*, That we give notice by publishing these resolutions in the State papers, to any and all parties holding any of said notes, writings and agreements, that the same will be protested and resisted; and also in the same manner warn all persons of this State of and against the swindlers above named."

We give space to this because it is an excellent example to farmers all over the country. Farmers in every community should know one another well enough to be able to act together and protect one another, and we look upon the Grange movement as doing much good in this way; but whether there is a Grange or not, there should be a neighborly feeling which will induce each farmer to stand by every other. The courts are quite sure to be on the side of justice—indeed, the exceptions are very rare, and it only needs that farmers who are swindled should take the stand assumed by these in Connecticut, to give all swindlers the worst of it. Therefore we say to every farmer,

DO NOT BE BULLIED OR BLUFFED

by any lightning-rod man, any one who claims a patent right on any gate or other thing you have in use; do not pay any note obtained under false pretenses, but when any of these fellows make claims of whatever kind, promise nothing, pay nothing, and sign nothing. If the claim is an honest one the claimant will allow time for investigation, and the very fact of his refusal of this is presumptive evidence of his dishonesty. There are probably ten swindlers making claims on patents to one honest one. Every well-disposed farmer, if he finds that he has unintentionally infringed on the rights of another, will, when convinced, be ready to make reparation, and every well-disposed owner of a patent will be willing to convince another of his rights. When one of these bogus ones threaten, recollect that he can not hurry you, and that it will take a long time to get his claim before the United States Court, the only court in which it can be tried. Apropos of this subject we would say to every farmer, if you have no

NEIGHBORHOOD FARMERS' CLUB

or Grange, organize one this fall for mutual improvement, as well as for mutual protection.

BAUNSCHEIDTISM.

A correspondent sends us an advertisement of a "Practical Baunscheidtist," and thinks it deserves a place in our Humbug columns. As we understand the matter, this treatment consists in pricking into the skin, by means of needles, a certain oil, called *Oleum Baunscheidtii*. So far as the composition of this oil is kept a secret, it belongs to that class of "remedies" that we consider as humbugs. Inserting remedies into the circulation is something that should be done with the utmost caution, or serious effects may follow. It is bad enough for people to take medicines into their stomachs, but to introduce them beneath the skin is an operation that should not be performed, except by a physician.

HOG CHOLERA MEDICINES.

The New York *Weekly Tribune* allows a Kansas correspondent to protest in very strong terms against those quacks who offer a dose of medicine for hog cholera for $1, and a prescription for $10, and to offer farmers the very excellent advice to "give such medicines and sure-cure swindles a wide berth," which we most heartily second. The hog is a most useful if not altogether a noble animal, and should not be made to take quack medicines in any form; it is well that the *Tribune* allows this plea to be made in favor of the hog. We judge that human animals are of much less consequence in the view of the *Tribune*, as it continues to publish medicines intended for those that are quite as quackish and mischievous as those it condemns for swine.

THE EXPERIENCE OF AN OHIO FARMER

a few weeks ago in New York should be a warning to all strangers, not in New York only, but in all large cities. In such cities, and especially in New York, simply because it is larger than others, many sharpers are always on the look-out for victims. The farmer in question asked two of these fellows on a ferryboat as to hotel prices; they at once offered to show him the hotels, took him to some low place, induced him to drink, and that was the last that he knew, until, on recovering his senses, he found that all his money and valuable papers, including checks, were gone. Of course the liquor was drugged, and equally of course the two fellows were not to be found. Unless a stranger is a good judge of character, he should, in a city like New York, ask information only in some respectable place of business, or of policemen. When men are so willing to offer their services, it is very sure to be the case that they have no good object in view.

Cost of Making Pork.—"A.," New Springfield, O. To make it pay to feed hogs at 8c. a lb, live weight, upon corn at 80 cts. a bushel, there must not only be kept the best kind of hogs, such as grade Berkshire or Essex, but the feeding and care of the hogs must be most careful, skillful, and economical. It may be made to pay, but it is very rarely done.

As to Renting a Farm.—"A. M." Springfield, O. A good farm of 90 acres, in good grass, should be cheap at a yearly rent of $300. It would be a very poor farmer who could not raise $10 worth per acre, and that would allow a rental of $300, or one-third of the produce, which is a usual rate in renting land.

Timothy and Clover with Hungarian Grass.—"J. F. W.," Lancaster county, Pa. Hungarian grass is a very unsuitable crop with which to sow down grass and clover. Its close growth kills the young grass and clover plants. As to growing crops without manure or the means of procuring it, that will be uphill work and can only end in loss. It is very probable that if rye is sown this fall, and plowed under in the spring, as you suggest, and clover sown then alone upon the well harrowed soil, might succeed. By cutting one crop of hay and leaving the clover until the following spring to be plowed under, a crop of corn might be taken. But there can be no crops grown without manure of some kind.

Successful Rearing of Chickens.—H. T. Wadsworth of Sonoma Co., Cal., is now keeping 800 hens and 500 chickens with satisfactory results. His method ensures success, and is precisely that which has been frequently recommended in the *American Agriculturist*. The fowls are kept in separate houses, each of which holds 50. There is a good range in which the fowls mix together, but all return to their own roosts at night. The houses are sheds 20 by 14; eight feet high at front, and sloping to the ground at the back; having open lattice work at each end for ventilation. The roosts are movable, six feet long, two inches wide, and one inch thick, and are frequently taken down, cleaned, and soaked with kerosene. The sheds are kept thoroughly soaked with lime wash, with some carbolic acid in it occasionally. The sitting nests are treated similarly. The feed consists of shorts and bran; wheat and oats; boiled beef heads; chopped cabbages and corn-stalks and boiled potatoes alternated. Running water passes the sheds and coops. Eight hundred hens consume 10 lbs. of wheat and 20 lbs. of oats daily; 26 dozen of eggs have been gathered in one day. The secret of success is cleanliness, a variety of good food and pure water. With these requisites there need be no failure.

Milk Fever.—"O.," Petersburg, Va. Milk fever results from excessive stimulation of the milk producing organs, and is only prevalent amongst high-fed cows. The Jerseys, being bred and fed especially with a view to rich milk, are consequently more subject to inflammatory disease in calving, at which critical period the whole system is in an excited condition. It is not the rich milk they yield that is the cause of the tendency to milk fever, but the system of breeding by which the rich milking quality is encouraged.

Chicken Lice upon Horses.—"G. E. W.," Dresden Mills, Me. When fowls are kept in horse stables, the lice from them frequently trouble the horses. As the vermin cannot easily be seen, the irritation they produce is not readily accounted for; on close examination, however, the very minute lice or fleas may be detected. The remedy is to move the fowls from the stable, whitewash it thoroughly, and rub the horse with a brush smeared with crude petroleum, or a mixture of lard with a twentieth part of carbolic acid.

Tumor on the Jaw of an Ox.—"J. F. M.," Spencer Brook, Minn. To dress a newly broken and discharging tumor with turpentine would cause it to continue running. It was very bad treatment, and would prevent healing. The proper course would have been to wash out the opening with warm soap and water, and then inject with a syringe a solution of four grains of chloride of zinc in one ounce of rain water. If the tumor is swelling again, it should be opened, washed out, and dressed as above. Give one ounce of hyposulphite of soda daily in his feed for a week or two.

"Reader."—Oregon. Had you given your name, we should have written to ask you to repeat your question. All that we can make out is that you wish to know how the Russians do something—but the writing, while it looks well as a whole, defies our power of decyphering.

A Very Early New Grape.—Mr. T. S. Hubbard, Fredonia, N. Y., sent us, Aug. 12th, a cluster of a new grape, from a vine which is an accidental seedling, found a little north of New York City. The fruit began to color on July 19th, was in eating condition by the 31st, and fully ripe and picked Aug. 8th. The quality appears to be about like that of Hartford Prolific, but holds to the cluster much better, and is from 15 to 20 days earlier. It is certainly a remarkably early variety, and will be very useful in localities where the season is short. The variety has not yet received a name, nor are any vines yet offered for sale.

How to Pack and Market Broom Corn.—"S. M.," Herkimer Co., N. Y. The methods of curing, packing, and marketing Broom Corn are all explained in a very interesting book entitled "Broom Corn and Brooms," which costs 50 cents, (or 75 cents bound in cloth,) sent postage paid from this office. It is impossible to give here, for want of space, any instructions that would be of practical use to you, it would therefore be better for you to procure the book referred to, which also contains valuable information about making brooms.

Muriatic (Chlorohydric) Acid for Thrush.—"W. B. McK.," Albemarle Co., Va. This acid is used as a caustic for destroying the diseased tissues so as to permit a healthy new growth. It is therefore used pure, being applied to the diseased parts by touching them with some tow tied to the end of a stick and dipped in the acid. The parts should be previously washed in warm water, and the inner portions of the cracked frog well cleaned by syringing. After the acid has been applied, the cracks should be filled with clean tow; the dressing and washing being frequently repeated. A similar but safer application is one ounce of chloride of zinc dissolved in a pint of water. This is sufficiently strong for a caustic.

Basket Items continued on page 393.

The Dairy at the Centennial.

Much interest has been excited amongst dairymen by the violent squabble, or dispute, which occurred in the committee appointed by the American Dairymen's Association, to take charge of the dairy displays at the Centennial Exposition. A small minority, one person in fact, made itself very conspicuous and demonstrative in opposition to the rest of the committee. The cause of the dispute seems to have been that a patented device for cooling dairy rooms, for which the party in question was the agent, was not put into the dairy factory at the Exposition at the expense of the Association. This party, who is not a dairyman, but a produce dealer, procured the wide publication of his grievances and charges against the committee and the model factory, and went so far as to counsel dairymen not to exhibit their products in the building erected for the purpose. Under the circumstances, this course was a very remarkable one, and unfortunately had the effect of greatly curtailing the contributions of the dairymen to the dairy exhibits.

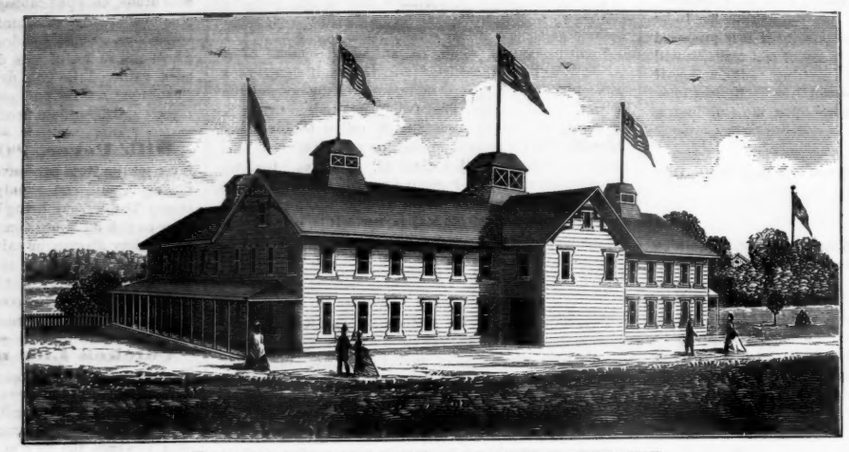


Fig. 1.—MODEL DAIRY FACTORY—CENTENNIAL EXHIBITION.

however, seems to have passed away by the retirement of the disappointed member of the committee, which is now left in harmony. The Canadian exhibitors, and other leading dairymen, among whom is the Hon. Harris Lewis, of New York, with the committee themselves, have declared the Model Factory to be well adapted for an exhibition, and to be well provided for the care of whatever dairy produce may be sent there for the display in October. We earnestly join with the committee in urging dairymen to seize this opportunity of showing what they can do to the thousands of visitors who will be at Philadelphia this month. It will be ever to be regretted if, having made a beginning by building a model factory, the dairymen should permit or oblige it to become a ridiculous failure by withholding their products, which alone can give the building an excuse for its existence there. Filled with dairy appliances and dairy products, the building would be an interesting attraction amongst many attractive exhibitions; and whatever gain is to occur through the exhibition, the whole will accrue to the dairymen of America.

For the information of our readers interested in cheese factories and creameries, we have engraved an elevation and plans of the Centennial Dairy Factory, built by Mr. Wm. Blanding, of Hawleyton, Broome Co., N. Y. The building is shown at figure 1, the main floor at figure 2, the upper floor at figure 3, the stage for the butter with ice-box and cooler at figure 4, and the section of cooler at figure 5. The building has a drive-way in the front, in which are the platform and scales. An open passage is made the whole length of the building, from which the doors open into the various departments, as shown. At the rear is an open court yard, and an open passage way, sheltered by a broad veranda, runs all around the wings. The construction gives abundant air and ventilation, and perfect facilities for the utmost cleanliness and neatness. The main building is 116 by 28 feet, and the wings 56 by 30 feet each. The cheese-room, butter-room, and creamery, are each 30 by 28 feet, and the cheese make-room is 26 by 28 feet. The second floor contains store-rooms and living-rooms. Grated ventilators are in the floor and ceiling of all the passage ways and store-rooms, giving abundance of ventilation, which can be regulated by slides in the grates. The plans of the butter and cheese-rooms in the main building are readily understood from the engravings. The raised platforms admit of thorough ventilation, and in the butter-room a constant flow of cool air is procured from the ice chest. The model factory is not furnished with shutters, which would be needed for actual use, to shade the store-rooms from the sun's heat, at least on the upper floor. The lower floor is well sheltered by the broad veranda which surrounds the building, and there shutters might not be needed. The extra expense, however, would be small in comparison with the benefits that would be derived from them. The cost of the building is about $8,000, which, however, is large on account of the difficulties of building in a city, but is not by any means excessive for a house of this size, and completeness and thoroughness of construction.

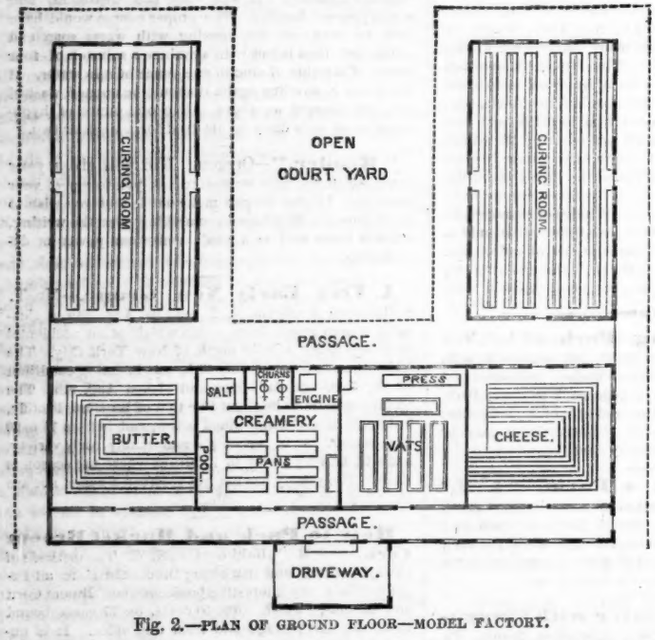


Fig. 2.—PLAN OF GROUND FLOOR—MODEL FACTORY.

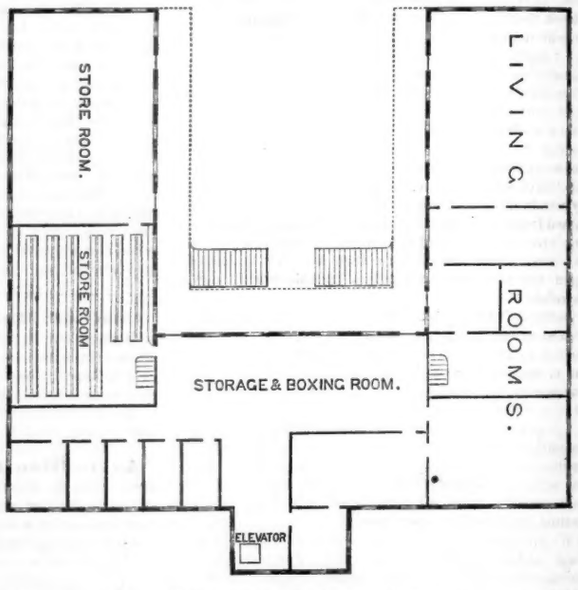


Fig. 3.—PLAN OF UPPER FLOOR.

At the July exhibition of dairy products there were but seven boxes of cheese from New York, against 600 from other places, of which Wisconsin and Canada sent over 200 each. Of course the loss, if any, in this ignoring of a brilliant opportunity,

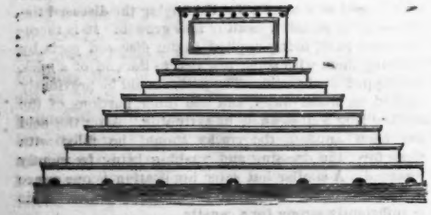


Fig. 4.—STAGE FOR BUTTER.

which cannot soon be repeated, falls upon those dairymen who were misadvised and misguided by injudicious and spiteful counsels. The trouble,

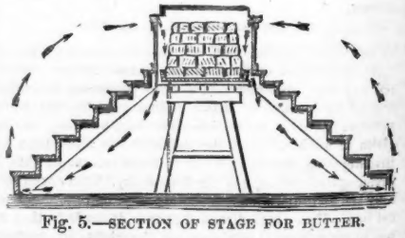


Fig. 5.—SECTION OF STAGE FOR BUTTER.

Read the Supplement with this Number.

The Publishers call special attention to the Supplement, an extra sheet printed this month (making **52** pages in all). The descriptions and illustrations of a large number of useful articles will give considerable information. It will be worth while for all to **read through** what is contained on the first and second pages of the extra sheet. Announcements are therein made which are of interest to all our readers. It will be noticed that all new subscribers for 1877 received this month will be supplied with the remaining numbers, issued this year after the reception of their subscriptions, **without extra charge.** This fact will help those who are proposing to raise clubs of subscribers, to commence at once upon their **easy work,** and no doubt very many will avail themselves of this opportunity of securing, with **so little effort,** some of the useful and valuable articles as described and illustrated in the supplement sheet....As Editors, we promise to spare no effort to meet the wishes of the Publishers, to have the *American Agriculturist* for the coming year exceedingly valuable to ALL its readers. We trust our readers will agree with us, that a Journal like this, going into a family for a year, will not only exert a healthful influence in stimulating thought and improvement, and thus elevate the mind standard of all cultivators of the soil, and of others too; but that it will also help guard against errors, against imposition, and assist all to make their labor more profitable. With this view, we invite all to lend a kind influence in making this journal even more widely known, and in drawing to it as readers, many who are now without its visits. This we ask as a friendly favor, aside from the rewards which the Publishers offer on a liberal scale to those who respond to their propositions.

Something About Premiums.

The *American Agriculturist*, when it passed into Mr Judd's hands, nearly 25 years ago, had a very limited circulation. Having become proprietor, he determined not only to give it a reliable character, but to largely extend its circulation among those to whom it would be useful. Instead of employing agents, as had been the custom with other papers, he hit upon a plan which made every man an agent, and gave that man a good commission for what he might do in extending the circulation of the paper —whether he sent in one or one hundred names. Instead of paying agents a salary or commission, he offered good or useful articles at much less price, if paid for in subscriptions, than they could be purchased for with ready money. Other agricultural papers took up this plan of giving premiums, and some of these continue to offer premiums. Others, finding the trouble of selecting premium articles of *the very best quality*, was more than they cared to undergo, ceased to give premiums, and all at once became very virtuous, denouncing the premium system, and proposing to pay money for new subscribers. Our arrangement is this: those who procure 20, more or less, subscribers, can have them at a certain lower price, or they can have their remuneration in excellent and useful articles. When an article is put upon our premium list, it is a guarantee that we think it has merit, and as it is offered in our premium lists and brought to the notice of hundreds of thousands of readers, that very fact induces the makers of the articles to give us those sent out as premiums at a very low rate. Knowing from our correspondence that this plan is most acceptable to our subscribers we have seen no reason for abandoning it. It has allowed those who live in remote places, far away from cities, to enjoy many household conveniences, farm and garden implements, and seeds, which they could not otherwise have, and it has enabled those who live in thickly settled communities to procure, by the expenditure of a little time, implements, machines, books, etc., that they could not otherwise possess. The premium business is a good deal of trouble, and to carry out the plan requires the employment of a special force, but so long as it meets the wants of so many people, it will not be given up. The premium list is not the same from year to year, but each October we publish a revised list, in which, for good reasons, some articles have been dropped, and others added. The premium list, in order not to encroach upon the space devoted to reading matter, is published in a supplement to this number, and will be found of interest to many of our readers.

Ogden Farm Papers.—No. 80.

BY GEORGE E. WARING, JR.

There seems to be something like "a revival" among the butter makers. I have had more letters during the past two months, asking about the construction of dairy houses, and the deep can system, than I had received in two years before. The following letter is a very good type of those received, and the information asked, seems now to be so generally desired, that it is worth while to repeat it, (with some modifications), although it has already been pretty well stated in these papers.

"I have a good spring of water, convenient to my barn, which delivers at the surface of the ground, it flows the whole year round, and the temperature of the water is about 50°. I propose to build a dairy with a room 10 x 12, the floor being 2 feet below the level of the ground, and cemented, and the walls to be of stone. Will it be enough if I make a water space in one side and one end 3 feet wide? I want to accommodate a dairy of 20 cows. I propose to erect a wooden room in which to make butter. Shall I have water space enough if I use cans 20 inches deep? Is there any danger of getting the milk too cool in such a room? Will three windows, 3 ft. square, one in each side and one in the end, be enough? Will I need any more drainage except a drain to carry off the waste water? As the whole bottom will be cemented, will there be any disadvantage from its being 2 ft. under ground? What butter worker would you advise getting? I think of getting a light horse-power, or dog-power, for churning."—This correspondent goes on to give the reason why he is going into butter making—he is disgusted with the factory system as practiced in his neighborhood; last year he sold his milk for $1 per 100 *lbs.*, but the firm breaking, he lost nearly $200. "This year they manufacture and sell cheese at $2 per 100 lbs, and declared a dividend for April of 63 cts. per 100 lbs. of milk, May 68 cts., and June 52 cts. That is as far as they have settled—in fact there is no settling about it, as we see no sale bills, and take what is left after they get what they want."

Another correspondent in Wisconsin uses a windmill to pump water for cooling milk before taking it to the factory, and says there have not been twelve nights this summer when there has been wind enough to pump what water was needed. He thinks he would prefer to pump by hand, rather than to depend on a windmill.

The question divides itself into two branches, one, where there is a natural spring of cold water, and the other where the water must be obtained by artificial means. The experience at Ogden Farm in this matter for nearly ten years past, has been with the artificial system, and I must say that it has worked, on the whole, very well. Being on the coast, we doubtless get more wind than we should if we were far inland, but with considerable observation of the use of windmills, I think that even where they cannot be depended upon to work every day, they would so greatly reduce the amount of hand-pumping needed, as to make their use always advisable. Our spring is a deep well, which overflows during seven or eight months of the year. It is about 1,000 feet away from the buildings, and the surface of the water at its highest, is about 35 feet below the milk-house tank, and about 50 feet below the barn tank. We use the smallest windmill that is made, (8 feet in diameter), and force the water through wooden pipes, (4 inches square, with 1¼ inch bore). For the first year or two checked places in the pipe sprung a leak, and had to be pinched together with a very simple clamp and carriage bolts. For five years past the pipe has not needed looking at, and I am satisfied that there has been no leakage. During a very long drouth, like that of this summer, the water gets so low in the well, that we are obliged to economize it, and as we have over forty head of stock to water, we can take no considerable amount for the milk-house. This has been the driest summer that we have had since the improvement of the farm was undertaken, and from two to four weeks past we have been obliged to use ice in the water tank. Every summer we are subject to a little inconvenience of this sort, but for ten or eleven months of the year our system works perfectly. Of course, if one has a constant spring of cold water at a sufficient hight to flow directly into the milk-room, the whole problem is solved, and everything is easy.

To answer the above letter: I would say that if the ground is dry—not springy, winter or summer —then the building may be set with the surface of its floor two feet below the ground, thoroughly concreted, and have only a drain to carry away the overflow of the tank; but if there is the least tendency to springiness, there should be a good underdrain laid under the foundation walls, and this should have a perfect outlet, to make sure that in wet, winter weather, there shall be no moisture under and about the walls, to enable the frost to heave them, or to ooze through the walls themselves. In addition to this, the walls should be surrounded for a width of at least a foot with gravel, or small stones, which will prevent the frost from taking hold of them. In our experience we have had more trouble from the cracking of the cement of our water vat, by the heaving of the outer walls, than from any other source. For a dairy of 20 cows the tank proposed is much to large. It will be ample if it is made 3 ft. wide and 10 ft. long, or across the end of the building, Indeed, a length of 8 ft. would be sufficient—supposing the milk to stand 36 hours before skimming. The smaller the surface of the tank, the less is the absorption of heat, and the more effective will a limited supply of water be in keeping down the temperature. As the tank is surrounded with thick walls, the only material absorption of heat will be at the surface, so that there is no objection to its having considerable depth, and I think it would be better that it should be 2½ ft. deep, rather than 1½, although the latter would be enough for 20 inch cans, for in the case of a slight leakage from any cause, there will still be water enough to warm the cans, when it stands even a foot below the surface. The water should be admitted at one end, and should overflow at the opposite end, which will keep up a slight movement of the cooler water throughout the mass. 50° is 4° colder than my stream, which I find to answer a good purpose, though I should prefer it to be even as low as 40°, were this possible. In carrying the water from the spring to the tank, the pipe should be laid, if possible, 3 ft. under ground, to keep it cold. Enough ventilation is enough, and two windows will be quite as good as three. Indeed, although we have two windows we use but one of them. An artificial power for churning will, of course, save labor, but for a dairy of 20 cows a dog will certainly answer as well as a horse. The butter worker that I use, is a table 3 ft. by 2, made of white oak, inclined a little to one side, with a groove cut along the lower side, and the two ends leading the butter-milk to a drip, under which a pail is placed. About ten pounds of butter are worked at a time, with a paddle of white oak a foot long, and with a handle at each end. The edge of this paddle is slightly sharpened, and it is used so as to chop the surface of the butter, spreading it out over the table. Then a sponge squeezed out of cold water, is used to sop up the butter-milk and moisture that appears on the exposed surface of the butter. Then the mass is turned together and chopped again, and again sponged; these processes are repeated until the butter is dry. We use Bullard's oscillating churn, which is a long rectangular box, with no paddles or cleats inside. Just a plain box, tightly closed at the top; it is moved horizontally endwise, and the cream washing from end to end, keeps the sides always washed down, and thus avoids the accummulation of half churned cream, which is very apt to attach itself to the sides of any paddle churn, and which, becoming mixed with the butter, may make it streaked, and interfere with its keeping qualities, for the reason that unchurned cream contains a certain amount of casein. The wooden room for making the butter had better be placed on top of the milk-room, as tending to protect it from heat more than a simple roof would do. Indeed, if drainage at a sufficient depth can be obtained, it would be better that the milk-room should be a cellar deep in the ground,

where the influence of the outside temperature would be very much less—the walls projecting above the ground only enough to give room for the ventilating windows. In cold climates, as a protection against frost, some artificial heating will be needed, even if the milk-room is deep under ground, and this may be best effected by pipes for the circulation of warm water, such as is used in greenhouses, the fire being outside in a lean-to. The same pipes may be extended to warm the churning room above. In summer time, the cream which awaits churning should be kept in a can immersed in the water tank. In winter it should be stood on or near the hot water pipes, long enough to have its temperature raised to about 60°.

Where an artificial supply of water must be depended upon, that is to say, where the water is to be pumped from a well or from a distant spring, the arrangement of the milk-house, water tank, etc., may be the same. The location of the windmill, and the arrangement of the water supply, must depend on circumstances. For illustration, we will assume that no spring and no constant well is available. In this case the best plan will be to construct a very deep cistern—20 feet would be better than less—immediately under the milk-room, and to place a windmill immediately over it, or very near to it. The water should be pumped through a suction pipe leading to the very bottom of the cistern, and delivering at the top of the tank—not coming up to the churn room and running from there to the tank, because this would expose it more to the heat of the atmosphere. The overflow should be conducted by a pipe to the *top* of the water in the cistern, say at the level of its overflow drain. As the only loss of water by this system would be by evaporation from the surface of the tank, and as very slight additional supply would be needed to compensate for this, the roof of the milk-house itself would doubtless furnish all that would be needed, and, indeed, the leader should not be more than one inch in diameter, so that in the case of heavy summer showers, there would be only a small amount of warm water delivered into the cistern. The smaller the shower supply, the colder will the water in the cistern be kept. Water in the bottom of a 20-ft. cistern, would be cold enough to keep the milk at a sufficiently low temperature, but to provide against long calms, when the windmill would not deliver enough water to cool the milk, without carrying too much heat back to the cistern, hand-pumping will sometimes be necessary. The size of the tank should be carefully adjusted to the requirements of the dairy, so that there need be no more surface of water exposed for the absorption of heat than is absolutely necessary. Indeed, it would be well to divide the tank with partitions, so that when the yield of milk is small, the water surface may be reduced.

The deep-can system, on which the foregoing directions are of course based, seems to have surmounted its "hard places," and under the influence of Hardin's patented apparatus, to be spreading itself very generally; but I desire to enter a slight protest against the success of this system being ascribed only to Hardin's device for using a refrigerator. We who have been advocating the matter through all these years on the cold water basis, object to having our credit entirely frozen up by the refrigerator method. The principle is the same in both cases, and whether the heat of the milk is abstracted by cold water or by cold air, is only a question of detail. The great point is that the milk shall stand in deep masses with the least possible exposure of surface to the air, and that it shall be kept at a temperature so low as to preclude the possibility of any souring during the time required for the complete rising of the cream. This may be done with water at 54°, but there may be a certain advantage in getting down even to 40° or less.

While the leading principle of Hardin's system is based on the use of deep cans, he has undoubtedly very much extended the range of its use wherever ice can be obtained in liberal quantities. Furthermore, we must accord to his vigorous advocacy of his method, the credit of developing the merit of the deep-can process, and securing its endorsement by many influential writers, who were formerly opponents of everything excepting the old-fashioned system of shallow setting, or the use of large shallow pans. Mr. John I. Carter, who is the manager of the Eastern Pennsylvania Experimental Farm, has made a thorough trial of Hardin's method, and reports as follows: (1) Milk set in deep cans, under proper conditions, will produce as much butter as will milk set in shallow pans. (2) Milk set at 40°, under proper conditions, will yield as much butter as if set at 60°. (3) Neither light nor ventilation are of any importance if the milk is sound, and kept at a low temperature. (4) Butter from milk set in tightly covered cans, at a low temperature, will be better, and keep longer than that from shallow open pans, at the temperature of spring-houses or vaults in hot weather. (5) Butter made from milk so set in cans, will be of more even quality than that made from milk exposed to the usual atmospheric influences.

The "Lancet," (London), of April 20th 1876, describes experiments made by the French Inspector General of Agriculture. He set cow's milk at various temperatures between the freezing point and 90°, and maintained the temperature for twenty-four or thirty-six hours. He found that the nearer the temperature is to the freezing point, the more rapid and larger is the collection of cream; the greater the amount of butter; and (because of less evaporation) of the skimmed milk also; the better the quality of both the butter and the skim-milk cheese. His theory of the cause of this result is, that the changes in the milk are due to a fermentation, proceeding from the growth of organisms which set up the process. He thinks that the application of this principle need not be confined to ice-producing countries, as a sufficient refrigeration may be secured by the use of running water. Mr. Ezra Michener, of Bucks Co., Pa., who, in repeated trials made several years ago, secured results strongly favorable to shallow setting, now believes that those results were caused by his neglect to take off all the cream from his deep cans, and since he has tried them more thoroughly in Hardin's refrigerator, he reports that the deep system gives the best butter; that it secures all the butter that the milk can yield; that the labor is much less; and that there is only the drawback that as the bulk of cream is increased, the labor of churning is increased in due proportion. As an offset to this the labor of taking care of the dairy utensils is very much reduced.

The chemical department of the Inland Revenue Service of England, has recently made analyses of 117 samples of butter, showing a remarkable uniformity of composition, except in the amount of water contained. This varied from 4.15 per cent to 20.75. May this not account for the difference between the firm, waxy, solid butter of the Jerseys, and the always soft, and sometimes almost oleaginous butter produced by poorer breeds? The water here referred to is not that which might be removed by better working, but is really water of composition, water which it is impossible to abstract by any process of manufacture. A difference of 15 per cent in the amount of water contained in butter, mitigates in some degree the enormity of the high price obtained for what is known as "gilt-edged" butter.

We have recently had a striking illustration of the influence of inheritance in developing the milking tendency. We have a heifer, now two years old, which is descended from some of the most persistent milking stock of the herd. On the 11th of June last she was observed in the pasture to have developed a full bag, and to be leaking her milk. It was supposed of course, although she was full in the flank, that she had aborted her calf at about 7 months. She was taken to the stable and milked regularly, giving from two to four quarts a day. I might have sold her for a fair price at the time, but owing to the value of her family, determined to keep her over, let her miss a year, and trust that she would come out all right after that. Two months later it became evident that she was carrying a living calf, and on the 27th of August she produced a perfectly formed and healthy, though very small heifer calf, which is now thrifty and promising. She has increased materially in her yield of milk, and her udder has become very much developed. This is an almost unique instance in my experience, but I believe that it may be sufficiently accounted for by the fact of the accumulation in her ancestry, (long bred with much care for milking qualities,) of a tendency to the production of milk, which has finally overleaped its natural bounds, and has attained a considerable development at an unusually early period of pregnancy.

Bee Notes for October.

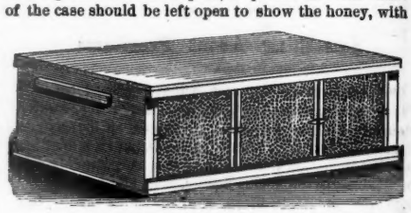
BY L. C. ROOT, MOHAWK, N. Y.

Preparing Honey for Market.

The form of the package that contains liquid honey will vary in different markets, yet one rule should always hold good. Whatever its size may be, (whether jelly cups, fruit jars, pails, or cans,) let the package be such as will be useful to the purchaser after the honey is consumed. A few seasons ago we used a large number of fruit jars of inferior quality, because of their cheapness, and the result was that all honey put up in standard jars sold first, and some of these inferior cans had to be emptied into flour pails before the honey could be sold. Some markets call for small packages, even as small as one pound or less, while others will call for larger ones, from which to retail in such quantities as may be desired.

I believe that when the process of removing honey from the comb by centrifugal force is more fully understood, and its perfect purity is appreciated, honey in this form will be more generally called for. In cold weather it candies, becoming very hard, in fact so hard that when very cold, it may be cut from a tub with a knife, and dealt out in a paper as readily as butter.

If box-honey is to be transported any distance to market, it should be properly packed in cases for that purpose. The number of boxes packed in a case will depend upon their size. Cases should not contain over 50 lbs. each. The ends of the case should be of basswood, and top and bottom of pine, if preferred. The sides of the case should be left open to show the honey, with



PACKING CASE FOR HONEY.

simple strips an inch wide, nailed across the top and bottom, as shown in the engraving, to keep the boxes in place. Two ends, with a handle on each, a top and bottom, and four inch-wide strips are required for each case.

Replies to Questions.

"What cheap work on bee-keeping would you recommend?"—I believe no book is better adapted to the wants of the beginner than "Quinby's Bee-keeping Explained."

"How late in the season is it safe to extract honey, and leave ample time for bees to fill up for winter?"—This depends upon the location, and yield of fall honey. Each one must understand his own locality, and be governed accordingly. In some sections bees gather little honey after Sept. 1st. In others they would secure enough for winter stores if the weather was favorable.

"Is buckwheat honey good for wintering bees?"—It is not considered the best food for winter, but if my bees could secure enough for winter stores, I should deem it advisable to extract all the white honey, and allow them to use the buckwheat honey.

"Is it expedient to take one or two frames of honey out of very heavy hives in the fall?"—If, after equalizing the honey, as directed in the Sept. Notes, too much remains in any hive, it would be well to remove some of it, and place empty combs in the center, where the bees can occupy them; or, if there is not a supply of empty combs, extract the honey from those removed, and return them, placing them in the center of the hive.

"At what time do bees stop breeding in the fall?"—Breeding will continue as long as forage of any kind abounds.

"Would you advise increasing the number of swarms in the beginning, or near the close of the season?"—If new swarms are to build their own combs, I should advise making swarms early in the season, but if empty combs can be furnished, it would be desirable for some reasons to make them later.

"What hive, and what sized frames are preferable?"—My preference is proved by the hive I use exclusively,

which is fully described and illustrated in the January No. of the present volume of this paper.

"Why do apiarians put combs 1¼ inch apart, when the bees naturally build them but 1¼ inch?"—One inch and one half apart from center to center, including space between combs, is found to be nearest accurate.

"Should bees be housed during winter, or left on their summer stands?"—To answer this question fully, would require an entire article. If all the necessary requirements are complied with, I am emphatically in favor of in-door wintering.

Science Applied to Farming.—XXII.

BY PROF. W. O. ATWATER.

More about Scientific Investigations—German Potash Salts.

I sometimes wonder what some of my good conservative farmer friends, who are satisfied with the old ways of tilling, breeding, and feeding that our great-grandfathers tried and proved, and take no stock in new-fangled notions and scientific theories, would think if they were to see how the experiments are made in the German and other European Stations, the labor, patience, and money they cost, and the ways their results are applied. The accounts of the experimental investigations on the subject of Animal Nutrition that have been published during the last fifteen years in the German language alone, would make what most people would call a good-sized library. The experiments thus described are numbered by hundreds and even thousands, each one of which has cost the labor of days, weeks, and even months. They have called in requisition the services of the ablest scientific men and the most successful farmers. They have involved an incalculable amount of thought, care, and toil, in the laboratory, the stable, and the study. The labor, much of it of a menial sort, has been performed willingly, even enthusiastically, by those to whom it has brought not wealth, but only meagre support. And it has at length come to be appreciated by the public. The first Agricultural Experiment Station was started in Germany some twenty-five years ago. There are now over seventy on the Continent of Europe, and are increasing more and more rapidly year by year, and many of them were founded by the farmers themselves, who contribute largely to their support.

Many will say: "Well, what real practical good do plain farmers get from all this scientific experimenting and book-writing?" These investigations have done a vast deal to settle the questions about stock-feeding, that occupy so much space in the papers, and are perplexing as they are important to millions of farmers on both sides of the Atlantic. Combined with the results of daily farm experience, they have shown for what purposes different kinds of fodder materials are best fitted, and how much each is worth; they have taught the farmers how to make valuable fodder out of poor hay and straw, how to employ lucerne, seradella, clover, and other forage crops to the best advantage; how to utilize waste products like flax-seed and cotton-seed and the oil-cake made from them, like the refuse from the manufacture of sugar from beets and of alcoholic spirits and starch from potatoes and grains; they have shown in what proportions these and scores of other fodder materials should be mixed and used, so as to get the greatest benefit from the least cost. And much as has been accomplished in the matter of feeding, still more has been learned about the nature and use of manures, and the cultivation of crops.

Correspondents frequently ask "Why not translate into English that German Farmer's Diary, you occasionally speak of as giving fodder and manure tables, and so much other condensed and practical information for farmer's use?" Well, that is a remarkable little book, and there are a number of others that, like it, are brimming full of just the plain, concise, practical information that every farmer most urgently needs, and nothing but the most costly research, combined with the longest and best experienee can supply. But these books are prepared, not for American, but for European farmers, and if put into English, would not be quite adapted for use here. In the matter of cattle feeding, for instance, many of the fodder materials most common in Germany, are but little known here, and *vice versa*. The German fodder mixtures are full of such articles as lucerne, seradella, rye-grass, bean-straw, rape-cake, beet-cake, and potato slump, while Indian corn and meal have not been experimented with to any extent there. We need tables and directions based on investigations of our home products. With what has been done on the other side of the water, these researches will be comparatively easy, but they must be made before we can have the results adapted to our use, as the German farmers have them.

Those who read these articles will perhaps be inclined to think that some of them are, at the bottom, less attempts to give practical information to farmers, than arguments for scientific experiments. Well, that is exactly what I intend them to be, and if I were to speak my mind freely, I should say a good deal more in the same direction. The fact is that the time is coming, indeed it has come in our older States, when we must better understand how to manage our soils, our fertilizers, our crops, our feeding materials, and our stock, or fail in our farming. And this definite knowledge of the principles that underlie the right practice of farming, is not useful simply for the better crops and larger profit it will bring. Like other knowledge it has a worth of its own, which can not be reckoned in dollars and cents.

German Potash Salts as Fertilizers

is a subject about which I receive a great many inquiries. In the German farmers' books spoken of above, most of these inquiries are plainly and concisely answered. But, as nothing of the sort is easily attainable in English, I will try to reply briefly to some of the most important ones.

The potash salts from the mines at Stassfurt in North Germany, are at present the most important source of potash for agriculture. It is a comparatively few years since the deposits were discovered, but the products have come into very general use in Germany and other parts of Europe, and are being imported quite largely into this country. When rightly used on soils deficient in potash, they are very profitable fertilizers. A vast amount of experimenting has been done with them, more in Germany than anywhere else. The results indicate that the usefulness of these salts as fertilizers depends not only upon the character of the salts themselves, of which there are various grades, but also on the kind of soil, the method of application, and the kind of crop.

The potash salts as taken from the mines contain only small proportions of potash compounds, the bulk consisting of other materials which have comparatively little agricultural value and are sometimes positively injurious. In the early history of the Stassfurt potash industry, many experiments were made with these crude salts, but, with the exception of the "Kainit," their use has been attended perhaps oftener by failure than by success. It has been found necessary to subject them to chemical treatment, by which the potash compounds are more or less completely purified. This is done at factories near the mines, where immense quantities of the potash salts are manufactured for technical and agricultural uses. As prepared for market, the potash fertilizers contain potassium in the form of either chloride of potassium or sulphate of potash, and, along with these, chloride of sodium, chloride of magnesium, sulphate of soda, and sulphate of magnesia.* The kinds and amounts of the potash and other compounds, varies with the different brands. The chloride of sodium (common salt) is sometimes beneficial to crops, and sometimes otherwise. The sulphate of magnesia is often very useful. But the chloride of magnesium, when present in considerable quantities, is apt to be positively harmful.

* For explanation of these chemical terms, and further accounts of their composition, value, and use, see "Science Applied to Farming Correspondence," on page 395.

High and Low Grade Potash Salts—Sulphates and Chlorides, (Muriates).

Besides these concentrated salts, a number of articles of lower grade, either waste products from the purifying processes, or in their original form as dug from the mines, are sold for fertilizers. As stated above, in some of these salts the potassium occurs as sulphate of potash, in others as chloride of potassium, or, as called by dealers, muriate of potash. They are accordingly known either as *Sulphates*, or *Chlorides*, (*Muriates*.) It is customary to reckon the potassium in all as "actual potash." By this is understood the amount of pure potash or potassa, which is either present as such in the salt, or would be if all the potassium present were in that form. The amount of actual potash varies in the different grades, from 7 or 8 per cent in the lowest, to 50 per cent or more in the highest. Unfortunately a large part of the German potash salts imported into this country, are of the lower grades. The disadvantage in purchasing these poorer articles, is a double one. They furnish very little potash, the bulk being made up of other and inferior or injurious compounds, and the purchaser has to pay the cost of freight and handling this extra material from the mines in Germany to his farm.

Use of the German Potash Salts.—Kinds to Select.

It is clear that for this side of the Atlantic the high grades must be the most economical as potash fertilizers. The *sulphates* are, on the whole, preferable, but the potassium in these is more costly than in the *chlorides*. The *chlorides* sometimes injure the burning quality of the leaf of tobacco, decrease the amount of starch in potatoes, and make them less "mealy" than is desirable, and decrease likewise the amount of sugar in sugar-beets. The sulphates, on the other hand, are always safe. They increase the quantity of the crops as much as the chlorides, without injuring, indeed often improving the quality. For buckwheat, corn, wheat, oats, and other grains, for grasses, and for wet soils, the chlorides are very highly recommended, and because of their cheapness, often to be preferred to the sulphates. To the lower grades, which contain large quantities of chloride of sodium, and sometimes of chloride of magnesium, the same objection would obtain as to the chlorides of potassium, but in greater degree. Generally speaking, the most desirable grades for our American farmers will probably be:

For Sulphates; either the highest grades, which contain from 75 to 90 per cent, or more, of sulphate of potash, corresponding to from 40 to 50 per cent of actual potash; or the sulphate of potash and magnesia, which contains 54 to 57 per cent of sulphate of potash, and 34 to 38 per cent of sulphate of magnesia.

For Chlorides: the "muriate" with 80 to 85 per cent of chloride of potassium, corresponding to 50 -52 per cent of potash.

None of these salts have any considerable amount of chloride of sodium or magnesium. There is a grade of so-called "Prepared Kainit," which contains some 29–33 per cent of sulphate of potash, which may also be recommended.

Where and How to Apply Potash Salts.

Whether a given soil is deficient in potash or not, is a matter that can best be learned by actual trial of potassic fertilizers. A great deal of care is necessary with these manures. Many failures result from misapplication. One cardinal point to be observed is the necessity of having the potash evenly and deeply distributed through the soil. To this end the potash fertilizers should be applied as long as possible before the seed is put in, either in very early spring, or, still better, in the previous autumn, for a spring or summer crop. It is an excellent plan to compost or mix them with earth before using. They should be either plowed or harrowed in. Potash salts are generally most useful when applied with phosphates and nitrogenous manures. In Germany, where the potash salts have come into general use, quantities corresponding to 200 to 500 pounds of the higher grades, and from 300 to 600 pounds of the lower grades to the acre are recommended. They have been found particularly good

for grass, clover, and other fodder crops, for beans and peas, tobacco, flax, grains and root crops.

A Southern House Costing $2,300.

BY S. B. REED, ARCHITECT, CORONA, LONG ISLAND, N. Y.

These plans, designed for a Georgia residence, will be adapted to the requirements of others desiring to build an inexpensive rural home, in any of the Southern States....**Exterior** (fig. 1).—The plan indicates that the proprietor is not circumscribed by want of land, and prefers to extend the area of the ground floor, rather than to build upward. The breadth of the front (48 feet), the large entrance and window openings, the spacious verandas, and broad steps, are each prominent and desirable features, indicative of comforts and hospitality. The elevated or second story part of the Main House forms a substantial and fitting center, around which the roofs of the wings and verandas incline, and adds largely in giving poise and character to the whole building. The hight from the ground to the frame work of the building is two feet. Its location should have a good surface drainage assured during rainy seasons, and afford pleasant outlooks from the verandas....**Interior.**—In most parts of the South very much of the year could be comfortably spent out of doors altogether, but for the requirements of shade and retirement. There are times, however, when severe weather makes it necessary that one's family should be well housed, and when a good fire is both a luxury and necessity. A house for such a latitude should have large rooms, with high ceilings, an abundance of door and window openings, and a plentiful spread of shady verandas. Where practicable, the windows should have folding sashes opening to the floor, if protected by outside coverings. There should be at least one chimney in the main or highest part of the house, having a large

Fig. 3.—SECOND STORY OF MAIN BUILDING.

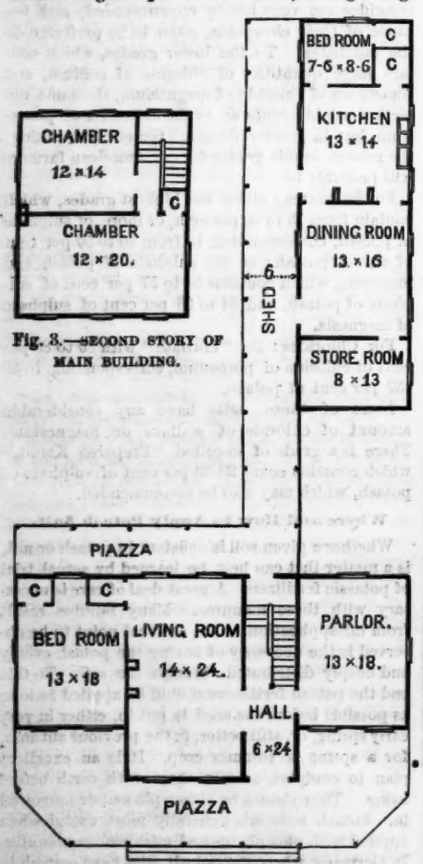


Fig. 2.—FIRST STORY.

open fire-place adapted to the use of wood for fuel, and having openings near the room ceilings into the flues, for ventilation. The Dining Room, Kitchen, and the more domestic offices, require a separate and distinct building, situated a short distance in the rear of the house, and connected with it by a covered passage way....**First Story** (fig. 2).—Hight of ceiling 10 feet. The simple arrangement shown provides for each of the above

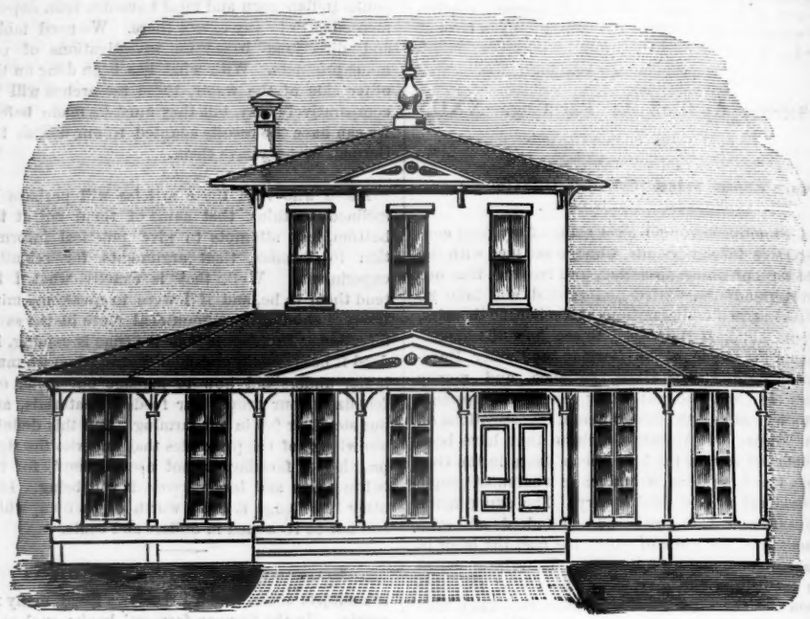


Fig. 1.—FRONT VIEW OF HOUSE.

requirements. The front Entrance is through large double doors. The Hall extends through the house. The Living Room, a large apartment adapted to a good sized family, is centrally situated, and protected on every side from the direct rays of the sun; it adjoins the pleasant and shady verandas front and rear, both being accessible through the folding windows, that open like doors down to the floor. It communicates with the hall through wide double doors, has a large closet and an open fire.—The Bed-room is of good dimensions, has three windows opening to the verandas, and one side window. The two closets are so arranged as to form an Alcove to the rear window. The ceiling of this alcove is arched over, producing a very pleasant effect. An opening is made near the ceiling into one of the flues of the adjoining chimney for ceiling ventilation.—The Parlor (or Library) is situated in the most quiet part of the building, where company may be entertained, or persons may engage in reading or study, without disturbance from those engaged in house-work. Large windows open to the front veranda, and other windows are provided at the side and rear. A covered Passage-way leads from the rear hall door to the food departments. These consist of a Dining-room, Kitchen, Store-room, and two Closets, and to the rear of these is added a Servant's Bed-room.—The Dining-room and Kitchen are each of ample size, with windows arranged on opposite sides, to admit a plentiful supply of fresh air. A Pump, Sink, and two Wash-tubs, are provided in the kitchen. The store-room and closets are thoroughly shelved. If desirable, a china closet may be easily constructed at one side of the fire-place, into which one of the doors already provided would open....**Second Story** (fig. 3).—Hight of ceiling 9 feet. This may be divided into two or more rooms, as required, for Bed-rooms. The cross-partitions may be 8 feet high, admitting a free circulation of air through. ....**Construction.**—Brick piers, placed 6 feet apart under all sills, are intended for the foundation. The remaining space is left unobstructed for the circulation of air. A cellar may be excavated, and walled up under the main house, with stairs leading to it from the rear veranda, under the main flight. In the estimate provision is made for a regular frame of sawed timber, which should be framed and raised in a substantial manner. The siding for the main house and wings is of 6-inch pine clap-boards, laid 5 inches to the weather. The roofs of the main house and wings are laid with hemlock boards; all other roofs and cornice projections are laid with inverted 1×4¼-inch tongue and grooved pine flooring, and lastly covered with I C charcoal tin, locked and soldered in the best manner. The cornices are constructed with good projections, and have neat truss supports. The verandas are made with simple parts. The columns for the front are 7-inch boxed, with bases, and scrolled spandrels—for the rear of 3×4 joist with bases, and plain spandrels. The veranda plates and rafters are planed for painting, and of course left exposed to sight. The pediments shown on the front are of open work, to allow the warmed air from near the roofs to escape. The upper frame-work (plates and rafters) of the rear building are also planed, and left exposed to sight from the inside. The inclosing and partitions for this part are of 1×4¼-inch pine tongue and grooved flooring, dressed on both sides, put on in a vertical manner, and nailed to the sills and plates. 1¼-inch pine battens are put around the inside of the rooms at the proper hight for a chair-rail (2½ feet to the upper edge), and joined to the casings of the doors and windows of like materials, and all thoroughly nailed with "clinch" nails to the upright boarding.—The roof is built as described for the verandas, is double pitch, and has sufficient spread to include the shed, making it a part of the same building.—The kitchen chimney is built nearly in the center of this building, has a large open fire-place, and has a good hight above the roof. All floors are of 1×4¼-inch tongue and grooved pine flooring, close laid and blind nailed. All rooms in the main building and wings are hard-finished upon two coats of brown mortar. All work usually painted has two coats of good paint. The roof gutters are made as shown in the *American Agriculturist* for May, 1875....**Estimate:**

8,000 Bricks in piers and chimneys, furnished and laid, @ $12 ₱ 1,000	$ 96.00
550 yards Plastering, @ 35c. per yard	192.50
5,054 feet Timber, @ 2c. per ft.	101.08
viz. Sills, 4x8 in.x261 ft. long. 32 Beams, 2x8 in.x21 ft. long. Ties, 4x6 in.x261 ft. long. 4 Posts, 4x7 in.x22 ft. long. Plates, 4x6 in.x 92 ft. long. 1 Piazza Sill, 3x8 in.x230 ft.l'g. 4 Hips, 3x8 in.x17 ft. long. 1 " Plate,3x8 in.x206 ft.long. 56 Beams, 2x8 in.x14 ft.long. " Beams,2x6 in.x384 ft.long.	
50 Joist, 3x4 in.x13 ft. long, @ 16c. each	8.00
300 Wall Strips, 2x4 in.x13 ft. long, @ 13c. each	39.00
370 Siding (6-inch clap-boards), @ 18c. each	66.60
170 Hemlock Boards, @ 16c. each	27.20
240 feet Cornice bracketed, @ 20c. ₱ foot	48.00
208 feet Simple rear Cornice, @ 8c. ₱ foot	16.64
38 squares of Tin, @ $8 ₱ square	304.00
6,000 feet of 1x4¼ T. & G. Flooring Pine, @ 4c. ₱ foot	240.00
24 Piazza Columns (complete), average @ $1 each	24.00
1 Stairs complete, $60; 31 Windows, @ $10, $310	370.00
20 Doors, @ $9, $180; 2 Mantles, $50	230.00
Sinks, Pumps, and Wash Tubs	22.00
Closet finish, $12.00. Nails, $25.00	37.00
Painting, $150; Carting, $30	180.00
Boards for outside Casings $30.40; Incidentals, $67.58	97.98
Carpenter's Labor	70.00
Total Cost, complete	$2,300.00

The Angora Goat.

BY R. PETERS, ESQ., ATLANTA, GA.

INTRODUCTION INTO THE UNITED STATES.—During the administration of President Polk, the Sultan of Turkey requested that a suitable person be sent to that country to experiment in the culture of cotton. Dr. James B. Davis, of S. C., was selected and commissioned to perform this important service. On his return, in 1848, the Sultan, desiring to reciprocate the courtesy of the President, caused nine head of the choicest fleece-bearing goats in his dominions, to be selected and presented to Dr. Davis. These doubtless were selected from the herds of Angora, a district of country lying among the Taurus Mountains, which traverse Asiatic Turkey, and which derives its name from its principal city, situated about two hundred miles east of Constantinople. In the year 1854 I visited the farm of Dr. Davis, near Columbia, S. C., and found his stock of pure-bred Angoras, (these goats are called by the Arabs *Chamal*, or Camel-goat, meaning "soft," or "silky,") to consist of seven females and two males. Besides these he had one pure-bred Thibet ewe, several head of one-half Thibet and one-half Angora, and quite a number of grade females, bred from the common short-haired ewe goats of the country, and his Angora bucks. I purchased all the pure-bred Angoras, and several of the Thibet-Angoras. Dr. Davis had fallen into error as to the native country of his goats; and, believing them to be *Cashmere*, quoted their fleeces as being worth from six to eight dollars per pound, while in reality they were Angoras, whose fleece, known to commerce as "mohair," has been an article of import into Great Britain and this country for years, and held at from sixty cents to one dollar per pound.

MALE ANGORA GOAT.—*Belonging to R. Peters, Esq., Atlanta, Ga.*

CHARACTERISTICS AND HABITS.—I have owned Angoras selected from six distinct importations from Asia, and have found them to differ greatly in size, fleece, and horns, and the shape of the ears. It is easy to trace several varieties of crosses in many of the importations, occasioned, doubtless, by the fact that stock-breeders, in their native country, are ignorant of the system prevailing here, of breeding up from point to point—and more generally to the admission of stray bucks from distant localities into the various flocks. In fact, it may be safely asserted that we have in this country, any quantity of grade goats far superior to many that have been imported. In the absence of any other standard than that suggested by my own judgment, founded on my experience with these valuable animals, I have for twenty years observed the following rules in selecting a stock buck. 1st. Pedigree dating back to ancestors imported from Asia. 2nd. Weight and length of the long, silky, ringletted, white fleece, and its freedom from kemp and mane on the back and neck. 3d. Form, size, and vigor. 4th. Long pendent ears, and upright, spiral horns.

By a persevering and studious adherence to this system of selection, I have obtained a flock of great uniformity. The Angora is a hardy, industrious, and nearly self-sustaining animal—subsists in its Asiatic mountain home almost entirely by browsing—and may be classed as herbivorous. Being active and vigorous, they roam over wide ranges of wild, rugged country, in search of food, utilizing and giving value to worthless vegetation refused by most other animals, and will feed and fatten double the distance from water that sheep can, as they travel much faster and can endure more. The Angora seems not to succeed well in the Middle and Eastern States where they are imprisoned (as it were) in small enclosures, and kept on grass in summer, and in closed barns in winter. Although from a locality on the fortieth parallel of latitude, north, they thrive best below that line on the Atlantic coast, though they do surprisingly well on the Pacific coast, as far as introduced, but especially in California, New Mexico, Colorado, and Arizona, whose climate and topography is said to closely resemble that of their Asiatic home, with its wet and dry seasons. It can not brook—scarcely endure—confinement, but loves to roam at will over the highest mountain peaks, thriving and yielding its rapid increase of progeny, and its ringletted, silky fleece, where other stock will starve. It is a singular fact that while the Angora will live in the snow all winter, in the southern latitudes, and do well on browse, they will die in a northern latitude, housed and fed, or in a very wet climate. Efforts have been made to acclimate them in England, and signally failed; while in France, after an expenditure of $350,000, they are likely to succeed in but one locality of limited extent. If not sooner sheared, the Angoras shed their overcoat of "Mohair" in March or April of each year. Their winter coating then grows slowly until about July, when the "mohair" starts and grows very rapidly, until January, when it gains its full growth, averaging about nine inches in length. The Angoras live to a greater age than Merino sheep, and are more prolific. I have three ewes in my flock, numbered by the Randall system of notches in the ears, so there can be no mistake as to their identity. No. 53 was dropped in 1861. She has raised 21 kids, brought her first in 1862, and her last in 1875, is now very feeble and on the decline. No. 68 was dropped in 1862, and No. 69 in 1863, both brought fine kids in March, 1876, at the age of 14 and 13 years.

FEMALE ANGORA GOAT.—*Belonging to R. Peters, Esq., Atlanta, Ga.*

AVERAGE ANNUAL CLIP.—Pure-bred Angoras will yield from five to eight pounds of "mohair" per clip, with one notable exception of a ten-pound clip from a celebrated no-horned Costamboul buck, the property of Mr. Landrum, of California. The general uniformity of the yield is indicated by the fact that in 1854 I sheared six and a-half pounds of "mohair" from a buck of the Davis importation, referred to above, and in 1876 I sheared exactly the same quantity from one of his descendants.

(TO BE CONTINUED.)

Among the Farmers.—No. 9.

BY ONE OF THEM.

It may seem strange, or rather like a too oft told tale, to read in October about the drouth of August, but as I walk over the parched grass, which crackles under foot, or poke about after a shower in the grain stubble, to see if I can find a single plant of red clover or of timothy out of the many which expanded their seed-leaves, or shot up their delicate spears, under the benign influence of May, or watch at night-fall to see if the dew and the moist sea-breeze will unroll the close-curled corn, I can think of hardly anything else. We had one blessed and all-blessing rain near a fortnight ago, and upon us and our thirsty acres it came down gently and tenderly at first, and then, after the surface was moistened, and the shingles swollen, and when all nature waited with open, open bosom, how it was poured out!—Not with blinding flashes and crashes of thunder, not in floods and with tempestuous winds—but quietly and bounteously, as it were lovingly—all day and all night, and longer—every thing seemed to give thanks—even many men; but some said, "too late to do much good."—"'t won't save the corn."—"It all stopped in the soil, and won't help the wells any."—There are folks who would not be suited, if they had their heart's wish as soon as they knew it. Their wants would grow faster than their wishes, and they would always find something to grumble about.

Even the morning greeting of neighbors develops character, and it is not hard to "spot" the grumblers. "Good morning, neighbor! How are you to-day?"—"First rate; how's yerself?"—or, "Bully."—That is one class—cheerful and positive. Another probably answers the same greeting, "Can't complain."—As if to complain was the great privilege of life, and as dear to the heart, as the right to grumble is to a Jack Tar.

Fine, Deep Tillage.

In some years simple tillage does not seem to be of great use. We can turn over a good sward, furrow out, and plant corn, and with a little fertilizer in the hill, and once or twice horse-hoeing, it does very well. All the better it would be, if a good dressing of manure were plowed in when the sod was turned over. In dry seasons, how different! tilage tells wonderfully, and the neighbors are quite agreed that it has never shown such results as this year.

Corn on Stubble Land,

or twice on the same ground, does far better than on sod. Potatoes were under suspicion this spring, and no one about here planted so many as usual; the result was, we hardly knew what to do with our last year's corn ground. Much of it was planted again with corn, and has uniformly stood the drouth well, and will give nearly a full crop, against half a crop on sod. I attribute this to two facts. One, that the soil which had been under the plow one summer, and exposed to the frost one winter, was in a finer condition of tilth, than that which was but once plowed, after lying for years in grass; the other, that the drouth came on so early that the roots of the corn were still only in the sod, and had not formed connection with the subsoil, where no doubt there was a store of moisture, which would have been of great benefit. We had not rain enough after corn was planted, to rot the sod, and the heat of June and July was so severe, that it was dried out with the soil and crops upon it.

Peaty Soils.

When black or peaty soils—those which contain a great proportion of organic matter in that condition of arrested decomposition, which renders them of all sour soils the sourest in a wet season, and if in good tilth, and in a dry season, of all sweet soils the sweetest—when these soils, I say, after having been a year or two under culture, are well tilled, they become fine as dust, and apparently dry as ashes, but any thing almost will grow well on them, corn, oats, cabbages, roots, potatoes for feeding, etc., and it is wonderful to see how obviously the moisture is absorbed from the hot air, and conveyed down deep into the soil. On even such soils, corn curled in the day, but opened broad and fresh every night, so far as I observed. But it was tillage that did it. On that which was not cultivated, but left lumpy, and not frequently stirred, the crops suffered worse than on other soils. No doubt the black color made it hotter, and if hotter, then surely dryer by day, and of course, unless in a state of minute subdivision, no moisture would be absorbed day nor night.

Summer-Fallowing to Kill Weeds.

As I said, we have not planted so many potatoes as usual, and some of us—one near neighbor in particular—has been summer-fallowing with the intention to follow with roots next year. All the first part of the season the crops of weeds would start as soon as the ground was plowed and harrowed, and I notice both on his land and on mine that plowing alone is not enough—only a few weeds start after plowing, but after a good harrowing, in one week weedy spots would be green with them. In moderately dry weather, and upon soils that would not bake to form a crust, I am inclined to think the harrow might be well followed by a roller. When there is moisture in the soil, rolling tends to keep it there, and pressing moist soil around seeds causes them to sprout. After the drouth became serious, weeds ceased to grow; no more germinated, and even some of those which had a good start stood still, so it has been on the whole a grand weed-killing year.

Where the good Crops are.

In a season like this, and may we never see another, it is not hard to tell beforehand where the good crops may be found. They will not be on farms or in gardens where the proprietor goes to the city every day. Plowing and hoeing among baked clods, and in dusty ash-heaps, is discouraging. Weeding mangels and carrots, even though you do not begin until four o'clock in the afternoon, when you see every plant where the earth is disturbed wilt down as limp as a rag within ten minutes, takes the pluck out of men, and so there are plenty of discouragements that keep men from hoeing, plowing, and the general tillage of growing crops. It is where men do their own work, are not set back by trifles, and manage by working late into the evenings, and on cloudy days, to get clean and well tilled crops. These are even now looking very well in deep soils, and not badly anywhere that I have seen. Tomatoes show this remarkably, melons and squashes not less, peas and beans also, and with potatoes it makes all the difference this year between half a yield and next to none.

Pork.

How many people inveigh against pork! "As unfit for a Christian to eat as it is for a Jew."—"The source of all the scrofula in the country."—"Unhealthy in every form, and promotive of all sorts of diseases."—Forty years of pork-eating has led me to a very different view of the matter. No form of animal food, exept locusts or grasshoppers, is so easily reared. No flesh of any domesticated animal is so flavorous, none so rich, so tender and delicate, none so white and beautiful, and none takes salt and smoke so well. The fat can well be substituted for lard for most uses. Fresh, or salted, or smoked, or rendered, it is unequalled. Pork is no food for babes—that I admit, nor for sedentary dyspeptics. It may be too hearty for delicate females, but it is real *man's* meat. There is no disagreement between salt pork and hard work; if anything goes wrong, depend upon it, the pork is not seasoned with sweat enough.

Pork and Apples—labials, linguals, and palatals, unite in one thrilling cord at the bare mention. It matters little how they are combined—the pork and the apples. Roast pork and apple sauce, pork and apple dumplings, fried salt pork and fried sour apples, boiled salt pork and baked sweet apples. These are farmers' stand-bys and luxuries, and alternating with boiled, baked, broiled, or fried bacon, fill up admirably between the twice or thrice a week that the butcher calls. Besides all this, as if this was not enough almost to make a man take off his hat to a nice porker—and certainly to a three hundred pounder; besides all this, no quadruped reaches maturity so rapidly, none multiplies so fast, none makes so good use of the food fed to it, and none fattens so readily at all ages. I fell in with

General Kilpatrick

the other day, and had an interesting talk with him about his farm horses, grade Short-horns, and pigs. I'll not attempt to repeat it, for I hope some day to visit his farm, and can then make a better story of it; but as an illustration of the amount of pork a good feeder may make, will mention that he kills at four months old almost uniformly, which is just as soon as the pigs will weigh 100 pounds, and shipping to New York, his returns average 100 dollars a month, about equally divided throughout the year, and is the best return that he can get for his skim-milk and corn. Now, 100 lbs. for a porker four months old is no unheard of weight; such pigs are not very rare, but when a man breeds and feeds so as to make it a uniform thing, it is remarkable. I think it was the General who said deploringly

How little our People know about the Use of Grade Animals.

There is, and there ought to be, a great deal more profit to ordinary farmers in raising grades—especially grade cattle, grade sheep, and grade pigs—than in raising thorough-breds; yet, how few know it. Kilpatrick's pigs are grades of small, compact, thorough-bred sires, and out of strong, deep milking sows. In the same way, by using a first-class Short-horn bull with excellent common cows, he secures grades of extraordinary excellence.

Cutting Brush.

There is something terribly discouraging about a protracted drouth. It seems as if work was of no use, and it is so very hot at mid-day that our people seem to take things rather easy. Men hired by the day are not so closely followed up, and with one consent extra long noonings are taken, and the time is not made up. The result is, work drags. The corn is not properly hoed and "laid by" in good season. Haying holds on. There are corners, and swampy spots to cut long after all should have been done and such work out of the way. The result of course is that brush-cutting is neglected just in the most killing time. The time to cut elders and alders, as well as bayberry and huckleberry, and hardhack, notwithstanding the late Mr. Greeley's advice, is just when a summer drouth is fairly established. There are very few things that can recuperate from the shock. I was particularly impressed with this the other day while taking

A Horse-Back Ride to Town.

Twenty-five miles is an unusually long ride for me, and so, wishing to reach New York by business hours, I started at day-break and went slowly. My journey lay through a part of the country mostly held either by large landowners who have inherited it, or by speculators. It is all within easy reach of New York, and was valued a few years ago at from two to ten times its agricultural value. Here, you may depend, was use for the bush-hook and hatchet. The whole country for several miles near the suburbs of the city, seems given up to nature. Where well cultivated farms were a few years ago, there is now a wilderness of cedars and white birches, on the poorer soils, and all sorts of hard wood growths on better land. I saw one recent clearing; the brush having been cut off within a month, was still lying in heaps ready to be burned, and it was surprising to see how little had grown a second time. I turned in and had a good look at the field. A few little sassafras shoots were struggling up, looking pinched and poor; chestnuts were sprouting again with some vigor, and blackberries hardly at all. The ground was so dry and baked out that there seemed no more vitality left in all surface-rooted shrubs, and only trees sending deep tap-roots into the ground, survived the dispensation.

When I could do so without making too great detours, I left the highway and took the back roads, but even then I could not avoid the well nigh

Omnipresent Tramp.

He was seen tucked under hedge-rows along the turn-pike, just waking, perhaps, from half-a-night's

rest. He was slouching under trees, begging at the farm-house doors, frightening the children at the spring, making friends with the watch-dogs, or shuffling along the road, with that peculiar gait, the bundled up feet, the hang-dog look, the appearance of being an athlete or a panther in disguise, or a maniac undisguised, that is peculiar to the breed. One thinks of Sing Sing, and if he has ever visited that famous prison, and seen the familiarity that exists, or did exist, between the keepers and the kept, and seen the plainest and most obviously necessary or beneficial laws broken by both, and even, as when I was present a few years ago, by one of the State Inspectors, appointed by the Legislature from their own number, it would hardly surprise him to know that there had been a general stampede or flight of New York jail-birds, and that like a cloud of locusts they had settled upon this part of New Jersey. At present we are having quite enough of this sort of thing, and it would take but a breath to rouse a burning indignation among farmers and country dwellers, that would make it hot for the tramps. They are not prepossessing, not agreeable people to meet, not adapted to make the walk to and from school pleasant for little girls. We associate with them stories of kidnapped children—think about Charlie Ross, of thefts in the neighborhood, (Mr. Wood lost his best set of harness not long ago), of our own two score of fat pullets taken off the roost, and fairly grudge the bowl of skim-milk and slice of ham and bread that we give more from fear than from charity. When they refuse the milk and ask for *coffee*, and want it hot, that is too much. Then we know they have milked the cows in the night, and are at our door only to see if there are any spoons lying about. So somehow the dog is unchained, and is with great difficulty restrained from doing actual violence, and the tramp is ordered off to the road; his milk poured into the swill barrel, and his slice of bread afterwards picked up at the gate.

Protection Societies.

We have an admirable law in New Jersey, which I believe is of general application throughout the State, which permits the citizens of any township to organize a "Protection Society," which, under the authority of the Governor and County Court, may appoint marshals with powers similar those of city police, while the officers have powers like those of Justices of the Peace. Some of these societies have exceedingly complete detective systems and detective officers, amateur detectives, so to speak, who have been very successful, both in preventing crime and in bringing criminals to justice. I have been told that in the township of Englewood no tramp is allowed to sleep or to pass the night on the highway, or to be upon the highway after nightfall, but is promptly provided with a lodging at a station-house in the village, which he pays for by work on the road the next day, and if he is not civil, and does not work well, he is "sent up" to the county jail for a longer or shorter term. This naturally leads the tramps to prefer to go round. Were such societies more general, the tramp problem might quickly find solution, at least in this State, and the click of the stone hammers would have a sweetness added to its tone, which it never before possessed. We greatly need some cheap and efficient means for providing

Broken Stone for Roads,

and who knows but Providence is kindly offering us in the despised tramp a long looked for blessing?

Blake's Stone-crusher, like his nut-cracker, is a triumph of art, but it is a ponderous piece of mechanism, needing a steam engine to run it; and as some of the corn huskers have failed simply because it costs more to haul the corn to them, and cart the stalks and corn away again, than to husk the corn where it grew. So for our common roads it would be cheaper to break the stone on the road, than to use the steam crusher. I think any town might well afford to give a man a good lodging with supper and breakfast, for breaking a cubic yard of granite or trap-rock into pieces as big as butternuts, and I concede that the stone might be measured after it was broken. It matters not how long it takes a man to do the job, time is of no account to a tramp; he has too much of a good thing, and we do him a real favor to help him dispose of a part of his stock profitably.

I despair of ever seeing fine, broken stone appreciated for road-making and road-mending. Every road should have a well drained hard bottom, and this is usually not hard to secure. Every hard-bottomed road should be dressed with nothing but fine broken stone. It will pack under wheels and the tread of teams like a floor, and will need so little repair, that with nearly perfect roads our highway tax would not be greater than now. Full loaded teams might always pass; pleasure driving would be a happiness; wagon-makers' bills would be reduced by half, and yet the wheelwrights would make a better living, because so many more vehicles would be in constant use. I believe sometimes in taking a Utopian view even of the tramp question.

How to Save and Keep Manure.

There is no question more frequently or seriously considered by the farmer, than how he shall get, keep, and spend an adequate supply of manure; nor is there anything about the farm which is of greater importance to its successful management, than the manure heap. There are few farmers now left who pretend to ignore this feed for the land; and few localities, even in the newer Western States, where manure now is thought to be a nuisance. We have gradually come to the inevitable final end of our "virgin farms," and have now either to save what is left of their wonderful natural fertility, or to restore them slowly and laboriously to a profitable condition. We have reached the end of our tether, and are obliged to confess that we have trespassed over the line which bounds the territory of the locust, or have improved the face of the country so much, that the protecting timber being removed, the water supply is becoming precarious, and springs, brooks, and rivers no longer flow as they did heretofore. To some extent the tide of emigration, which has flowed westward so many years, is now eddying or even ebbing, and the cheap, worn lands of the East are finding purchasers, who undertake to bring them back to their former condition. At the same time Eastern farmers are discovering more and more certainly that they must increase their crops, and make one acre produce as much as two have heretofore done. The only way in which either of these classes can succeed, is by keeping sufficient stock to manure their farms liberally; to feed these animals so skillfully and well, that they shall pay for their feed with a profit, and in addition leave a supply of rich manure, with which the soil can be kept in a productive state, and to save and use the manure with such care that no particle of it be lost. It is not every farmer who can procure all the manure he needs; but very many can save what they have, with far greater economy than they now do; and this, although it may seem a question secondary to that of getting manure, is really of primary importance; for by using what one has to better purpose, he opens a way to increase his supply. We have found this to be the case in our own experience, and by strict attention to saving and preserving every particle of manure in its best condition, we have succeeded in so enlarging our supply of fodder, that the number of stock that could be fed was largely increased each year, and very soon it was necessary to go out and buy animals to consume the surplus. To bring a farm into improved condition, there is no cheaper or more effective method than this.

The ordinary management of manure, in open barn-yards, where it is washed by rains, dried by the sun's scorching heat, and wasted by every wind that blows, is the worst that is possible. In this way half or more of the value of the manure is lost. By figuring up what it would cost to purchase a quantity of manure equal to what is thus lost, the costliness of this common method would be discovered, and the question how much could be afforded to take care of the manure would be settled. When properly littered, one cow or ox will make a ton of manure every month, if the liquid as well as the solid portion is saved. Ten head would thus make 120 tons, or 60 two-horse wagon loads in a year. A pair of horses will make as much manure as one cow, or 12 tons in the year. A hundred sheep, if yarded every night and well littered, will make 100 tons of manure in the year, and ten pigs will work up a wagon load in a month, if supplied with sufficient coarse material. The stock of a 100-acre farm, which should consist of at least 10 cows, 10 head of steers, heifers, and calves, a pair of horses, 100 sheep, and 10 pigs, would then make in the aggregate, 316 tons of manure every year, or sufficient to give 12 tons per acre every fourth year. If this were well cared for, it would be, in effect, equal to double the quantity of ordinary yard manure; and if a plenty of swamp muck could be procured, at least six hundred tons of the best manure could be made upon a 100-acre farm. If this were the rule instead of a rare exception, or only a possibility, what a change would appear upon the face of the country, and what an addition would be made to the wealth of the nation!

Pits for Keeping Manure.

The first requisite to the economical saving and handling of the manure, is a manure pit. The size needed can easily be calculated, by allowing one cubic yard for every ton to be made. For 600 tons of manure made yearly, a pit of a capacity of 300 cubic yards should be made, as it would be emptied twice in the year. A pit 30 feet long, 15 wide, and 4½ feet below the surface, would hold 300 tons,

Fig. 1.—SECTION OF MANURE PIT.

if the contents were heaped 4½ feet above the surface. The simplest manure pit is a mere hollow in the ground, which prevents the liquid portion from flowing away from it in odorous streams here and there, but permits it to sink into the ground and escape. The first improvement consists in making the hollow water-proof, so as to retain the liquid part. This may be done by cementing the bottom of the hollow. The next improvement would

Fig. 2.—SECTION OF PIT WITH DRAIN IN CENTER.

be to build a retaining wall of brick or stone, to hold the manure heap, and to make a drain by which the surplus liquid matter might be carried off into a cistern. This method, which is very cheap, simple, and effective, is illustrated at figure 1, in which the walls are shown at *a*, *a*, and the drain by the dotted lines below the surface of the ground. A further improvement may be made, as shown at figure 2, by sloping the bottom, *c*, *c*, from each side to the center, inside of the retaining walls,

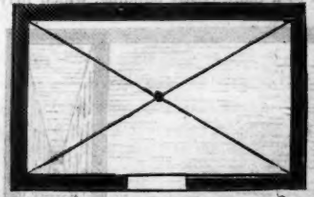


Fig. 3.—GROUND PLAN OF FIG. 2.

a, *a*, and placing a drain at the lowest point, to carry off and collect the liquid manure. At *b* is an opening at either of the end walls, through which a cart or wagon may be driven, to unload or remove the manure. These openings may be left open or closed by gates. At figure 3 is shown the ground plan of this manure pit, with the opening in the walls referred to. If desired, there may be two

openings, so that a wagon may be driven clear through. A further enlargement may be made by arranging the pit as shown at figure 4, which represents a cross section of it. There are the retaining

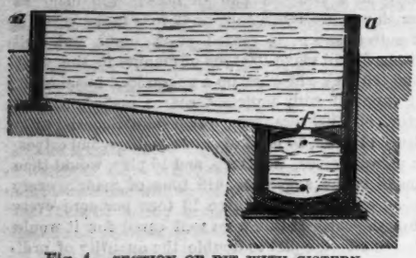


Fig. 4.—SECTION OF PIT WITH CISTERN.

walls, *a*, *a*, as before, and the pit is sunk to a convenient depth beneath the level of the ground, the floor being cemented and sloping to the rear, where the cistern is placed. The cistern is arched over, and an opening, seen at *f*, fig. 4, to be covered with an iron grating, is made in the arch, and the floor of the pit over this cistern, slopes each way to the grating, as seen at *f*, in figure 5. This figure is a ground plan of the manure pit, the open space shown at the front being the gateway or entrance.

A point for serious consideration is the covering of the yards or manure pits. The excellent designs here given, were made by Mr. R. Scott Burns, the eminent English agricultural engineer, and were recently published in "The Country," an English rural journal. Although originally intended for the circumstances of English farmers, there are no points in which they are not equally applicable to our own necessities. With regard to the covering of the manure, we consider that if English farmers find this needful or economical, it should be much more so with us. As a protection against the rain-fall, we need it much more than they do, for the average rain-fall in England is but 30 inches, against 45 to 50 here, and our rain descends sometimes in torrents, while their's consists mostly of frequent showers. If, as a protection against drying and baking by the sun, a cover is needed, then with our more ardent summer's heat, we should require it the more. The frequent adoption of manure cellars beneath the barn or stable is a substitute for covered yards or pits, the wisdom of which is certainly questionable on the score of healthfulness and cleanliness, and many farmers may have reason to charge the loss of valuable animals by unexpected and unexplained disease, to their manure cellars. The covering of the manure pit may then be considered as advisable whenever or wherever it can be afforded. This may be done in as simple a manner as possible, by a plain board roof, supported upon posts, or by a more costly building, which may be

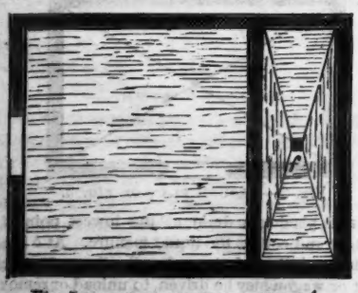


Fig. 5.—GROUND PLAN OF FIGURE 4.

made to serve at times the purpose of an open feeding shed as well. The roof should in any case be provided with eaves-troughs and waste pipes, the flow from which could be turned upon the manure, if desired, or conveyed away by drains when not needed to moisten the heap, or to dilute the liquid manure. At figure 6 is given a cross section of a covered pit, suitable for a large farm, where everything is carried on with ample means, and a view to the greatest economy and profit. In farming there can be no profit without outlay; seed must be sown and the soil fertilized before a harvest is returned; and one of the greatest drawbacks of American farming, is inadequate capital to invest in the enriching of the soil. Therefore we do not believe the cost of such a structure as this to be at all an extravagant or unnecessary outlay upon any otherwise well appointed farm. At any rate the plan may be modified to suit a slender purse, or the ideas of a cautious farmer, who likes to feel his way at first. The pit and cistern differ in no way from those last described, except in form. Upon the retaining walls timber sills are laid, into which the posts are framed. The structure of the frame at the end is clearly shown in the engraving. The dotted lines are intended to indicate a method of framing differing from that shown by the unbroken lines. These latter serve to give a stiff and strong

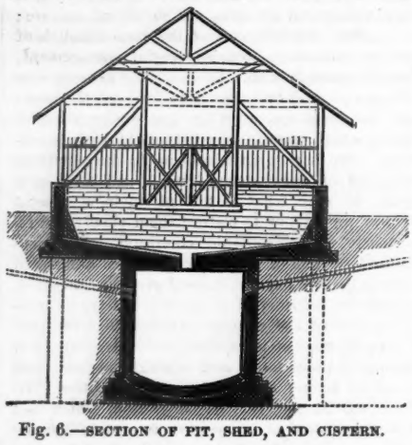


Fig. 6.—SECTION OF PIT, SHED, AND CISTERN.

frame with a high elevation, sufficient to admit a load of straw beneath the collar beam. The entrances, of which there are or may be six, are closed by gates. At figure 7 the side view of the shed is given; the dotted line representing the floor of the manure pit. The dotted lines in figure 6 show the position of the drains from the stables and feed-sheds, by which the liquid manure is carried off. It is obvious that these plans are intended to be used in connection with a system of saving and using the liquid manure. In regard to this we can now only say that any farm carried on under a system in which the saving of liquid manure is neglected, can realize only a part of the profit it might be made to yield, and that its owner ignores one of his most valuable resources.

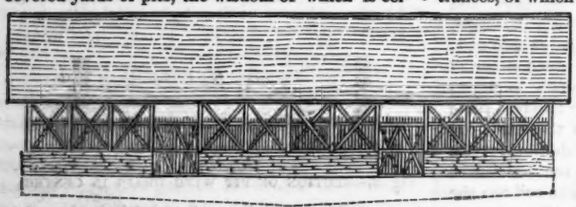


Fig. 7.—SIDE VIEW OF PIT WITH SHED.

THE MANUFACTURE AND USE OF FLOUR PASTE.—The manufacture of paste consumes a considerable quantity of flour, which must be of at least fair quality. In the city of New York alone 150,000 barrels of paste are made and used yearly. The paste is made by sifting the flour and passing the lumps between rollers until the whole is fine. It is then mixed with water and boiled in steam-jacketed vats which hold about three barrels each. The paste is used by makers of pasteboard, some of whom consume six barrels per day. Bookbinders and machine-folders of periodicals and pamphlets use a paste of extra good quality specially prepared for the purpose. Shoemakers and bill-posters use a very inferior quality. Paste is also used in the manufacture of rope, twine, carpets, suspenders, pocket-books, and a very large quantity is used as "size" in various textile manufactures. On the whole the consumption of flour in the arts and manufactures, in the United States only, amounts to considerably more than a million barrels yearly, requiring 5,000,000 bushels of wheat for its production.

A Method of Hanging Hogs.

An easy method of hanging a hog or a beef, is by

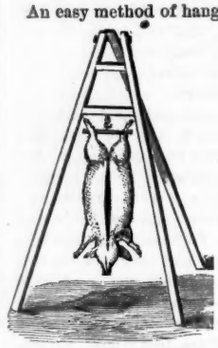


Fig. 2.—TRIPOD SET UP.

the use of the tripod shown in the accompanying engravings. It is made of three pieces of 3 × 3 oak scantling, 6 feet long, connected at one end, in the manner shown, by means of an iron bar one inch thick, passed through a hole bored in each piece. The two outside pieces are fastened together by two cross pieces, bolted to them, so that they are spread at the bottom sufficiently, which would be about 3 feet. A hook is fastened to the lower cross-piece, upon which the hog is suspended. To hang the hog the frame is laid upon the ground with the hog between the outside legs, the third leg being drawn backwards, as shown in figure 1. The hog being hooked by the gambrel stick to the cross-piece, the frame is lifted up, and the hinder leg is spread out so as to support it, as shown at figure 2. The frame may be lowered easily when the hog has to be taken down, and as the frames are cheaply made, and occupy little room, it will be well to have several of them. They may be made to serve other useful purposes.

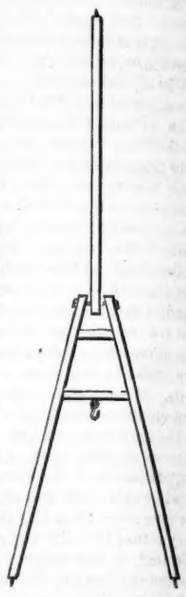


Fig. 1.—TRIPOD.

Bins for Storing Potatoes.

There is always more or less loss of potatoes when they are stored upon the cellar floor. The dampness of the floor, and the impossibility of ventilating the bottom of the heap, cause decay, which spreads through the mass, and it gives off a disagreeable odor. Potatoes are not necessarily offensive, when kept in a cellar, but are frequently made so by want of care in storing them. We have seen a plan of putting them in bins, made of strips of wood with spaces between them, in which they were kept in perfect order, without any loss by rot, or any moldy, earthy smell arising from them. The

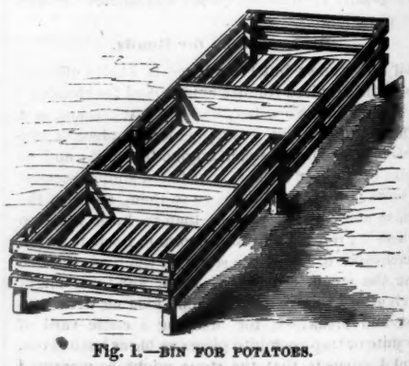


Fig. 1.—BIN FOR POTATOES.

bins are of two kinds. One, shown at figure 1, is suitable for storing a small quantity, and may be

divided, so as to keep different varieties separate. Being made of strips, thorough ventilation is secured from the bottom upwards. When a larger quantity has to be stored, the bins are made on the plan shown in figure 2, in which strips are used as before, but the bottom is made sloping forwards,

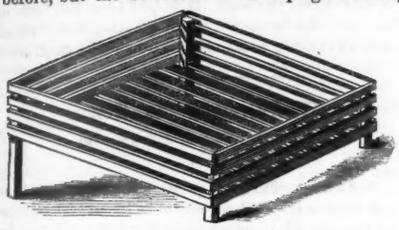


Fig. 2.—SECTION OF POTATO BIN.

and a number are made which fit into each other, so that they can be piled up, as shown in figure 3. The bottom bin is placed upon legs, which raise it from the ground. When the bottom one is filled with potatoes, another bin is placed upon it, resting upon short feet at the corners upon the ends of the posts of the lower bin. The bins are thus locked together so that they can not be pushed out of place. Any number may be used that may be

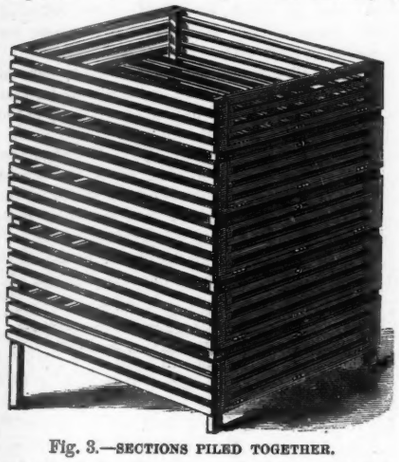
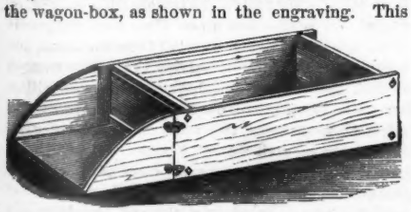


Fig. 3.—SECTIONS PILED TOGETHER.

found desirable. To remove the potatoes as they may be needed, the front of each bin is made to open upon hinges placed at the bottom. The front may be dropped down altogether, or only partly opened, when the potatoes slide down to the front. By having a movable spout, the potatoes may be guided into bags held to receive them. The doors at the front are fastened by means of a staple and a pin of wood, as shown.

Unloading Corn in the Ear.

Several correspondents have sent us descriptions and sketches of a plan for unloading corn from a wagon-box, which is an improvement upon the method described in the *American Agriculturist* for August. It is as follows; an addition is made to the wagon-box, as shown in the engraving. This



ATTACHMENT TO WAGON-BOX.

is movable, and is fastened, when in use, to the sides of the wagon-box by hooks, as shown in the illustration. When the corn is to be unloaded, this addition is hooked on to the box, the tail-board is removed, and space is provided for scooping up of the corn ears. When the corn is unloaded, the piece is removed, and may be hooked on to another wagon, the same piece thus serving for several. This is now a seasonable contrivance, and is very easily and cheaply made.

A Pen for a single Pig.

Many persons living in country towns, and who have gardens from which there is considerable waste produce, find it economical to keep a pig which will consume the garden refuse, as well as that from the house. In the country the "poor man's pig" is a means of saving several dollars each year, from what would not only go to waste, but would in time become a collection of offensive matter; and with those who—although not poor—still study economy in their domestic arrangements, a yearly supply of bacon and a pair of hams that cost next to nothing never come amiss. If it were not that from neglect and mismanagement the pig-pen is generally a blot upon the rural homestead, a sink of filth, and a source of foul odors, the keeping of a pig would be quite unobjectionable even in a garden. But the pig itself would never have become possessed of the disagreeable character which it now has, had it been given a favorable opportunity of distinguishing itself as an animal loving cleanliness rather than filth, and had it been provided with a clean, convenient pen, and clean wholesome food and drink. The fact is that a pig-pen, instead of being all that is disagreeable and disgusting, may be kept neat and free from bad odors, and indeed inviting in appearance, if the proper care is taken of it. There would then be no fear of infection from eating pork, and the meat might be made as wholesome and inviting as the flesh of poultry, which, if permitted, are as general foragers among filth, as pigs ever are. To remove all objection against keeping a household pig, there must be provided a proper pen of ample room, of solid materials, and which can be kept perfectly clean, well aired and free from vermin. The refuse must be frequently removed or deodorized by the admixture of dry earth. A plan for such a pen is here given. Figure 1 shows the elevation. It is ten feet square on the floor, and eight feet high to the eaves, the frame is made of light timber as follows: sills 4×6, joists 2×6, floor two-inch plank, studs 2×4, the plates of 1×6, rafters 1×6; the roof is of boards, covered with Johns' Asbestos roofing, and the walls of inch boards, battened, or of clap-boards. There is one door and one window at the front, and a ventilator in the roof. There is an open yard floored with plank at one side, 6 feet wide, leaving a door at the front which falls down and makes a platform for the first entrance and the final exit of the pig. The floor should be caulked tightly with tow or strips of cloth, such as "carpet rags," and saturated with pine-tar put on hot. The building is raised a foot above the ground, by which it is kept dry and free from vermin. The yard is boarded up tightly for about four feet, and at the side there is an opening three inches wide through which the litter and refuse is pushed with a scraper. The floor of the yard is made to slope slightly towards this opening, and should be kept covered with dry earth from the garden, which, when returned to it, would be a rich fertilizer. If a plenty of earth is used, there will be no offensive smell, and the pig will be found remarkably neat in its habits, keeping the inner apartments clean. If otherwise, the floor should be scrubbed with water and a broom, and a pailful of water should be thrown over the pig as an occasional bath. The floor plan is shown at figure 2. The door opens into a feed-room where the feed-bin and a half tub for mixing feed may be kept. The feeding-pen is at the front, and the sleeping-pen at the rear, and

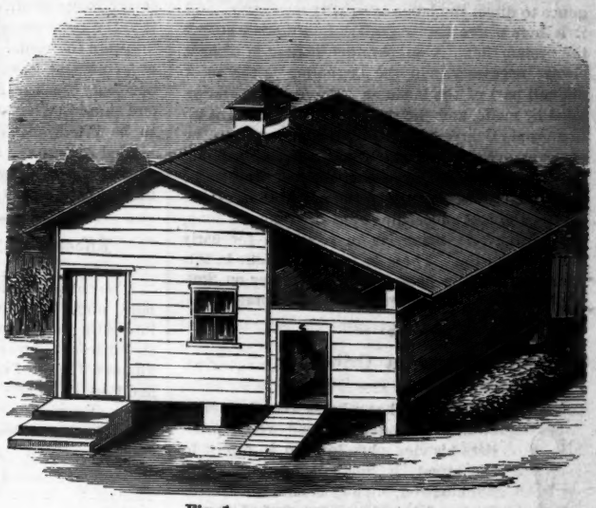


Fig. 1.—VIEW OF PIG-PEN.

this opens into the yard by a swinging door, which shuts of itself, and is shown at figure 3. At fig. 4 is shown the arrangement of the feed trough. A

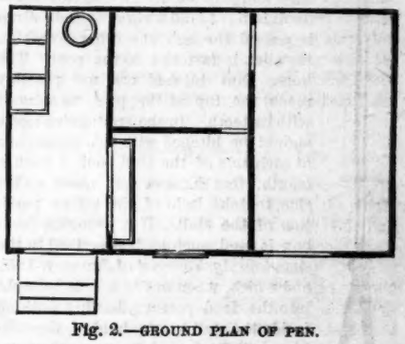


Fig. 2.—GROUND PLAN OF PEN.

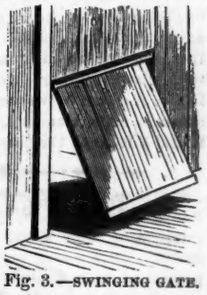


Fig. 3.—SWINGING GATE.

sloping board guides the food into the trough through an opening in the partition from the feed passage, and a strong frame of cross bars is hinged to the partition and rests upon the trough, by which the pig is kept from rolling or lying in it. Such a pen, neatly built, and white-washed, will cost about $20; and two days' labor of any man or boy handy with tools, will be sufficient to complete it. If a half-floor is put up over head, just within reach, it will serve as a store-room for some garden tools and the usual "odds and ends" of a garden.

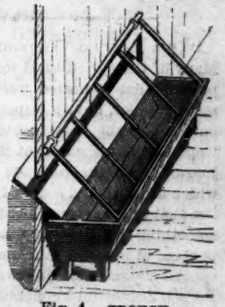


Fig. 4.—TROUGH.

PREPARATION FOR SOILING CATTLE.—It can not be doubted that soiling may be profitably carried on, especially upon dairy farms, although the practice involves extra labor. It is by labor only that the raw materials of the world are made useful, and the more labor that is *judiciously* expended upon anything, the greater the value of the result. If twenty cows can be kept upon the produce of twenty acres, by the extra work of one man, whose labor costs $200 for six months, there is clearly profit in employing the extra man. If 100 cows can be kept on 100 acres by the labor of five men continuously employed throughout the season, the resulting profit would clearly be greater than in keeping

20 cows without their labor. That one cow per acre can be kept on an ordinarily good farm by soiling, has been perfectly well established, but it can only be done by the employment of more labor than is usual under the ordinary system. But labor alone is not all that is needed. The skill and intelligence to direct the labor is equally necessary; and it is here where the majority of farmers who try the system fail. A preparatory course is almost always necessary, and the beginning is the most difficult part of the business. Careful preparation must be made, and the soil can only be brought up to a proper degree of fertility, for final success, by perseverance. Those who would make a beginning must commence at this season, the first crops to be fed must now be sown, and the preparation of the soil for the first succeeding crop must now be done, by plowing and manuring in readiness for early sowing in spring. There is no better guide in this business than the book entitled "Quincy on Soiling," which should be studied by all interested.

Hitching a Crib-Biter.

A correspondent who has a horse that is a crib-biter and windsucker, and which practices his vice when hitched to a post in the street, is recommended to try a hitching-rod, such as is here illustrated. It consists of a piece of hickory, white oak, or tough ash, about 24 or 30 inches long, thickest in the middle, where it may be an inch in diameter. A ferule with a ring is fastened to each end; in one ring a common snap-hook is fixed, and a short leather strap is passed through the other, by which the stick is fastened to the post. The horse thus hitched can not possibly reach the top of the post, to seize it with its teeth. In the stall such a horse should be hitched with two straps, one at each side of the stall, and of such a length, that he can not reach either side, to take hold of the rail or partition of the stall. If a swinging feed-box is used, such as is described in the *American Agriculturist* of January, 1875, and which, when not in use, is brought into the feed passage, leaving nothing inside the stall to take hold of, the crib-biter will be forced to suspend operations, as he cannot draw in the air or "suck wind," unless he has some projecting object that he can lay hold of with the teeth.

"OUR SPECIAL FOREIGN CORRESPONDENT."—Many of the agricultural journals, on the principle perhaps that imported goods are conceived to be most popular, have a "special foreign correspondent." Not the least curious thing is, that this "special" correspondent favors at least a dozen journals with precisely the same foreign letter, in which are gathered some of the strangest absurdities that are gravely printed from time to time, as something sufficiently valuable to be worth foreign postage at least. From one of the latest of these special communications, we learn that the leading French Zootechnist concludes after "an exhaustive examination," that the flesh of animals affected with the virulent blood disease known as "charbon," which is our "black leg," or carbuncular erysipelas, is fit for food, and farmers are advised "to slaughter such animals and rapidly prepare the meat for market." The probable and proper effect of such an act would be to land the farmer in the criminal's dock, to answer a serious breach of law, which in this country forbids the sale of diseased meat. We are also told that sour milk fed to pigs, produces the disease known as rachitis, or "rickets," which is an idea that is certainly foreign to all experience here; further, that horses have died from typhoid fever in consequence of feeding *near* to fields dressed with night soil from cities, and that "an inventor alleges to secure" a uniform temperature in churning cream, by using a double sheet-iron churn, with felt between the walls, all of which is a shining example of supreme nonsense.

HARVESTING MANGELS.—It is always preferable to get the mangels dug and put away in pits before severe frosts occur. But it should not be forgotten that the more mature the growth the more nutritious are the roots. To top the roots for the sake of feeding the leaves, is injurious. The leaves are necessary for the full development of the roots, and should be left upon them until they are ready to be lifted. If some supplementary fodder is needed for cows or sheep, it would be better to pull some of the roots before the main crop is harvested, than to denude any part of it of the leaves.

Effects of Artificial Fertilizers.

A recent experiment made upon a farm in England, under the directions of Dr. A. Vœlcker, is interesting, as showing what we have frequently stated from our own experience, viz., that Peruvian guano is the most effective fertilizer for grass land, and that its effects are not exhausted in a single year. The results of the experiments, as shown in the following tables, speak for themselves.

Plots of one-tenth of an Acre.
Manured January 20th. Grass cut July 31st, 1875.

Number of plots.	*Fertilizer used.*	*Quantity per plot of one-tenth acre.*	*Weight of green grass per plot.*	*Increase over yield of plot manured.*	*Cost of dressing.*
1	Peruvian Guano.....	45 lbs.	2,084 lbs.	813 lbs.	$1.50
2	Soluble Guano.....	45	1,983	714	1.20
3	Soluble Guano.....	33¾	1,823	554	1.20
	Superphosphate....	22½			
4	Superphosphate.....	45	1,634	365	0.60
5	Nothing.....	....	1,273	....	....
8	Superphosphate.....	22½	1,743	474	1.20
	GermanPotashSalts	22½			
	Nitrate of Soda.....	22½			
9	Soluble Guano.....	33¾	1,738	459	1.46
	Nitrate of Soda.....	11			
	Superphosphate....	11			
15	Barn yard Manure....	1 load, 2240 lbs. ?	1,698	429	1.20

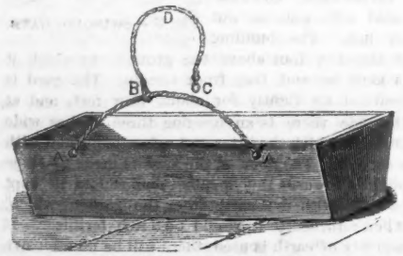
The weight of grass cut the second sear, (1876), was as follows.

No. of Plot.	*Weight of Grass per Plot.*	*Increase over yield of plot not manured.*
1	893 lbs.	260 lbs.
2	819	153
3	852	214
4	752	114
5	638	....
8	624	(14 decrease.)
9	668	48
15	847	209

The fixed expenses being the same for each plot, the extra yield in the two years shows the return for the cost of the fertilizer used. Thus $1.50 worth of guano, returned 1,073 lbs. grass, or the equivalent of 357 lbs., of hay, (estimating hay as one-third the weight of grass), equal to a cost of 42 cts. per 100 lbs. of hay. The results show further, what is learned from nearly every experiment with mixed fertilizers, viz., that they are not so effective if mixed as when each is applied alone; one seems in some manner to neutralize some of the useful effects of the others when they are mixed.

Feed-Trough and Halter.

"F. W. B.," St. Louis Co., Mo., sends the following description of a feed-trough and tie for cattle, which he uses with much satisfaction; and also a sketch to illustrate it, which is here engraved. "The trough rests on the floor, is 4 feet long. *A*, *A*, are inch auger holes; a rope, 4 feet long, is put through them and tied. Another rope, *D*, has a ring spliced on one end, and a 'snap-hook' on the other. The longer rope passes through the ring, *B*, and when the rope, *D*, is put over the neck of the cow, the 'snap,' *C*, hooks into the ring. This allows the animal to stand or lie down with comfort."



FEED-TROUGH AND HALTER.

Wool-Growing in Texas.

BY L. S. NICHOLS, SAN ANTONIO.

Notwithstanding the present depressed state of the wool market, there seems to be a great number of persons who contemplate coming to Texas for the purpose of engaging in the business here. Some of my correspondents are men having more or less experience in Northern States, and by reason of limited range desire to change their location to a climate less rigorous, and where a larger range can be easily obtained. Others are writing for information in regard to the business with a view of engaging in it here for the first time in their experience. Many of the inquiries come from young men with limited capital—some propose to start with one flock, some with three thousand stock sheep, and one man wants to purchase ten thousand to start with.

Now, to all I would say there is room here in Texas for all that will come, and a climate for that business that is equal, if not superior, to any in the civilized world. As to the measure of success that will attend the business here, it will depend almost entirely on the man who conducts it, for beyond any question, properly managed, it is one of the most remunerative pursuits that can occupy the attention of a man of good judgment, who will personally superintend his flocks; at the same time it is a business in which no one can succeed who will not either by himself, or by some faithful and experienced assistant, give it close attention.

All will readily understand that a ranch here to commence with on a stock of 5,000 head will be at a much less pro rata expense than one of 1,000 head. Certain expenses have to be incurred for one thousand head, which need not be materially increased for three thousand head. To commence right, a sheep ranch must necessarily be fitted up with one good corral—to be used for dividing, catching, and marking sheep, with dipping vat, shearing floors, and wool shed—and when properly arranged, so as to handle easily and satisfactorily one thousand head of sheep, can easily be used for three flocks of that size. The corral for these purposes is not used for corraling the flock at night, or at any other time, except when there are some to catch, or the flock is to be divided.

It is very difficult at present to get a good lot of graded ewes in this part of the State for a new ranch, that will be of uniform character and age, and those who will be satisfied with nothing less than fine ewes to start with, will be obliged to pay a strong price for them, or take a flock as they run of all ages, from one to eight years, or else import from some other State. Experienced men will, of course, act in the start upon their own judgment in the selection of their stock of breeding ewes, but I would most certainly advise the inexperienced against the purchase of high grade ewes, either here or to bring here from a northern State. Good select Mexican ewes, two years of age, to be crossed with strong well-wooled Merino or South-Down bucks, will not only be a safer class of stock for a commencement, but they will cost less than one-half the outlay to start with, and the beginner can have a uniformity in his flocks that he cannot get at any reasonable expense, if he buy high grade sheep as a basis. The generally received opinion that the Mexican ewes are all alike, is erroneous, as I can prove to any man who will go with me to see a few flocks in this section, and compare them with others that have been carefully selected one hundred miles south of the Rio Grande River, and brought here during the past winter. The experience of a number of men who have tried it,

proves that breeding ewes brought here from Northern States do not seem to do well, or give satisfactory returns either in increase or wool for the first season. A flock of well selected Mexican ewes, from one to three years old, will cost, delivered at San Antonio, one dollar and seventy-five cents per head. A mixed lot of all ages can be bought for $1.40 to $1.50. These selected ewes will give from 80 to 90 per cent increase, as they are good breeders and nurse well. They will give from two and three quarters to three pounds of wool after the first clip, or after being here one year. If they are brought late in the summer from the Rio Grande, they will not give over two pounds of wool the next spring, as they will lose most of the summer's growth by driving through the chaparal on their way up. If purchased after October 1st, they will be shorn of their summer fleece, as the custom in Mexico and southwestern Texas is to shear their sheep in March and October, but fall shearing is discarded now by most of the flock masters around San Antonio. A safe estimate of cost for one flock, or 1,500 head, taking as a basis Mexican ewes, will be about as follows:

1,500 selected Mexican ewes, @ $1.75	$2,625.00
50 head good rams, South-Down or Merino, @ $40	1,200.00
One good Mexican shepherd, $12.50 per month	150.00
Supplies for shepherd, $7.50 per month	90.00
Extra hand during lambing time	25.00
Shearing and sacking 1,500 fleeces, @ 6¼	93.75
Salt and Sundries	100.00
Total	$4,283.75

This will cover all outlay for the flock for one year, except the corrals, and there is such a wide range of expense in this item, that it can only be properly estimated on a knowledge of the proposed future operations. The expense of a corral would be about $600, all complete, and is ample for from three to five thousand sheep. As to the grazing lands—there are plenty of locations to be rented for a term of years at a cost that would not be more than the taxes on the land. The estimate for shearing and sacking is full. My Mexican shearers worked for three cents per head this spring, and I furnished them rations. After keeping the sheep here one year, if they have been well selected, they will give full three pounds per head, and the half-blood yearlings will shear full as much as the original flock, and the wool of course of a much better grade for market. Mexican wool, unwashed, in the San Antonio market, sold this year at from 13 to 15 cents per pound.

A beginner should have his arrangements so as to carry on his operation—the purchase of original flock and the payment of all expenses for the first year's business without using the income from his first crop of wool. This should be left to go toward payment of the second year's expenses, and he can then calculate on meeting all his necessary expenses connected with his flocks from the proceeds of wool. After the third year he will have an annually increasing surplus of income over expenses from wool alone, leaving the increase of the flock to be the main basis of profit.

Fifteen hundred head is considered about the average number for one shepherd to take care of here, with help for one month in lambing time. I would prefer to have lambs come from October to December, so as to have all docking and trimming done in January, and have the lambs out of the way at shearing time. The grass in the winter months is fresher than in the summer, but the principal reason is, that during the summer months it is almost impossible to either dock or castrate lambs in this climate, as the screw worm is one of the most troublesome and fatal of all pests, and this will apply to cattle and horse stock as well as sheep. Sheep here have an abundance of grass the year round. The enforcement of our State Law in regard to cutaneous diseases will effectually prevent the spread of scab, and with ordinary care it is easily eradicated from the flock by the use of tobacco and sulphur.

The annual expense of keeping sheep in this country need not exceed thirty-three cents per head—after corrals and pens are once established. Eighty per cent increase and five per cent per annum loss in all flocks from one year old up to six years old is a safe calculation to make; from six years old the estimate for loss should be doubled. As to the best cross to make upon the Mexican ewe, there is a variety of opinions. Most flock masters prefer the Merino. My own views are in favor of the South-Down as first, and Merino on the produce of this first cross. Any inquiry not already satisfactorily answered, I will take pleasure in answering by mail upon application by letter.

A Self-Feeding Corn Crib.

In parts of the West, where the chief use of corn is to feed it to stock in the open field, a crib may be used that will not only store the corn, but will supply it to the stock as they may need it, without any further handling, than merely filling the crib. Corn being very cheap, and labor dear, it is an object to save labor at the expense of the corn. But as hogs are always kept along with cattle under such circumstances, no corn is lost; what is dropped by the cattle, is picked up by the hogs. The crib may be made of logs or plank, but should be built strongly. It is of the ordinary form, but open at the bottom, where it is surrounded by a pen, reaching a foot above the open bottom. The pen is larger than the crib, so as to give room for the stock to reach the corn, and is of a convenient hight, or about 30 inches to 3 feet. The pen is planked over about a foot below the bottom of the crib, and if the space below is filled with earth, it will enable the building better to resist, when it is empty, the heavy winds of the prairie. The engraving on the next page shows the form of one of these feeding cribs, which may be made of any suitable size, or of any convenient material.

A Cool Cellar with a Well.

The space above an ordinary well is not only lost, but frequently gives opportunities for the admission of vermin or of surface water, with whatever impurities may be contained in it. There is no necessity that a well should be open to the air, on the contrary, the more closely the water is confined, the better it is. The best of all wells are the driven wells, which are simply enlargements of the underground water-channels, having no connection with the surface, except through the pump tube. In some places it is a common practice to use the upper part of an ordinary well as a milk cellar, having steps to go down into it, and shelves upon which to place the milk pans. This is a dangerous and uncleanly practice. A correspondent from Pennsylvania, who has come into possession of a farm having a well so arranged, asks how to improve it at the least cost. As we know of several such cases, we have prepared the engraving on page 380 to show a plan for their improvement. The well should be arched over solidly with brick or stone, and cemented upon the top. It may then be covered with earth, leaving a space at one side for the pump tube to go down. The excavation may then be enlarged, and the walls bricked or stoned up, making a cellar. The floor may be cemented or bricked. A low shed may be built over the cellar, as a roof, or a complete building having a floor may be erected, and serve for a store-room, or an outer kitchen in which the pump is situated. In this case a doorway into the cellar and steps leading down are made. The well will then be cut off from the surface, and the space above it properly utilized. Except in cases where, as sometimes happens, quick-sand works into the well and gradually fills it, requiring an occasional removal, the lower part may be covered as here recommended.

VALUE OF LEAVES AS LITTER.—The very complete and thorough investigations of German chemists at the Experiment Stations, into the composition of forest leaves, have given as one result the knowledge of the value of leaves as litter to be used finally as manure. The following table of the constituents of beech and pine leaves, is taken from some published reports of investigations made in Bavaria. For comparison we add to it the quantity of the several matters contained in a ton of wheat straw, from which it will be seen that while beech leaves are at least worth as much as straw, pine leaves are not much inferior in value to it.

Annual Produce of an Acre of Forest, in pounds, and its Composition compared with that of a ton of Wheat Straw.

	Dry matter	Ash.	Potash	Lime.	Magnesia.	Phosphoric Acid.	Sulphuric Acid.
Beech leaves	2,973	165.5	8.81	73.08	10.90	9.32	3.23
Pine leaves	2,842	41.5	4.32	16.84	4.28	3.23	1.51
Spruce leaves	3,693	121.3	4.30	54.37	6.20	5.72	1.97
Wheat straw	2,000	85.2	9.80	5.20	2.20	4.60	2.41

Farming Without Stable Manure or Stock

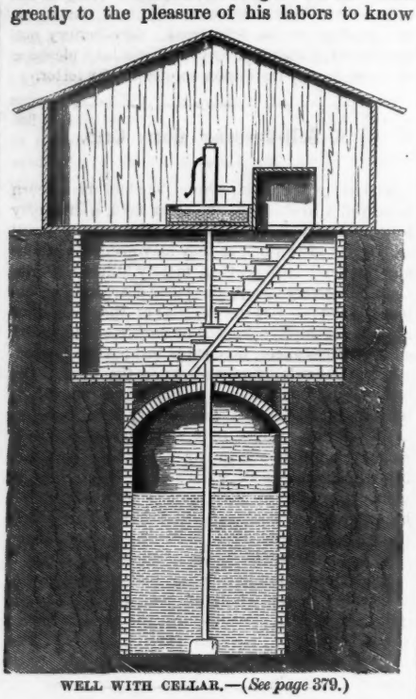
We have previously referred to the successful farming of Mr. Prout, an English farmer. His system is to grow continuous crops of grain, roots, and clover, entirely by the use of artificial fertilizers. He keeps no stock except the work horses, and the crops are sold upon the fields when ready for harvest, the purchasers harvesting and carrying them away. This exceptional manner of farming is made profitable by Mr. Prout, and some of the crops sold this season are the eleventh in succession upon the same fields. Although the season has been remarkably unfavorable, the yield and prices of the crops were satisfactory. Barley was sold at an average price of $40 per acre, the purchaser to cut and carry it away. The wheat crop brought from $42 to over $54 per acre. Oats realized $32 for a crop damaged by wet weather, up to $48 per acre for those in better condition. For 11 acres of mangels $117 per acre was bid, and $115 for 8 acres, but they were not sold. As these last prices were the values in the ground, unharvested, the root crops seem to be more profitable under this system, than even the grain crops.

THE GOOD POINTS IN LIGHT BRAHMAS.—Of the four leading varieties of Asiatic fowls, the Light and Dark Brahmas, the Buff and Partridge Cochins, the Light Brahma is unquestionably the most popular. We see this not only in the poultry yards of the villagers and farmers, but at the Agricultural Fairs and Poultry Shows. The most numerous coops, and the largest birds, are always to be found among the Light Brahmas. The American passion for great things is gratified by the size of these birds. Cocks weighing 14 to 15 lbs. are not uncommon, and, in exceptional cases, they have reached 16 and 17 lbs. Cockerels weighing 12 and 13 lbs. are shown every season. Ten lb. pullets are brought out frequently, and 12 lb. hens flourish in every exhibition. We have found all these varieties fair layers of large eggs. The Light Brahmas are hearty feeders, and grow quite rapidly. The chickens make early broilers, and the pullets lay well through the first season. They make very handsome yellow-skinned poultry, and the flesh is of good quality and sells well in the markets.

FALL WEEDS.—Spring weeds stand a chance of being eradicated. There is the planting, and the cultivating, and hoeing, which leave the fields so clean at the commencement of the hay season, that hardly a weed is in sight. The peril begins just there. Weeds grow apace among the shading corn and potatoes, and long before harvest many plants mature and scatter their pestilent crop. There is nothing a farmer pays dearer for than the rest that allows them to thrive. These seeds will be right in the way of cultivation the next season, and for years to come. They injure the succeeding hoed crops, and the grain and grass crops. It is a nuisance to leave charlock amid oats or barley, and a fraud to sell grain with foul seed in it. It is a nuisance to have to pull dock out of your winrows of hay, and something worse to sell hay with dock in it. Few farmers are awake to the economy and honesty of absolutely clean fields. We want to keep up the good fight in the fall months.—It will pay.

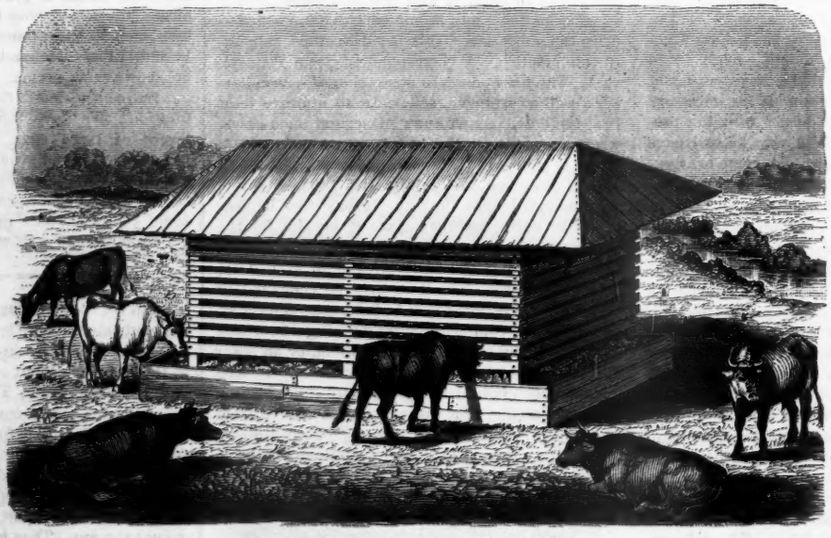
Weeds—A New One—Condrille.

Good cultivation requires us to destroy the plants we do not want, as much as it does to encourage those that we desire; in other words, the killing of weeds is quite as important as any of the necessary operations of the farmer and gardener. In order to fight weeds successfully, one must not only know them at sight, but must also know something about their modes of life, how long they live, and how they multiply. We hold that we do our readers as good service in making them acquainted with a new weed that threatens to be troublesome, as when we introduce a new plant that promises to be useful and profitable. Many of our weeds—not all, but a large majority—are natives of other countries. It is true that they do not take long to become naturalized citizens, and as those persons, who were brought up under the strictest monarchies, often become, in a republican country, the most radical, so do these plants from other lands quite outdo the "native Americans" in their appreciation of our subtropical climate, and in their readiness to accept the "largest liberty," which the American farmer is so willing to grant them. The old and familiar weeds show no disposition to depart, but new and strange ones are ever ready to come; every bale of South American or Australian wool, every cargo of ballast that is unloaded, every parcel of trees that comes from an European nursery, and even every box that contains the personal effects of an immigrant, whether of the North European Dane or Swede, or the South Russian Mennonite—each of these may be looked upon as a Pandora's box with possibilities of untold evil. As a single spark is sufficient to begin a great conflagration, so one tiny seed, which may be hidden in either of the receptacles which we have suggested, or may even come concealed in the coat of some choice animal, may establish a crop that shall waste the energies of our farmers in the effort to subdue it, and cost our agriculture its annual thousands, if not millions. Could some one have cut up the first plant that appeared here of Canada Thistle, Toadflax, Viper's Bugloss, and others of the legion, before it flowered, who can compute the money the act would have saved the country! It probably can not happen that any new weed can be literally "nipped in the bud" on its very first appearance in the country. People in general do not notice plants enough, to know whether one is a stranger or a native, or care enough about the matter to destroy it, even if it has the aspect of a dangerous interloper. Generally a new weed must make the inconvenience of its presence felt near the point of its introduction, before any one will take the trouble to find out what it is, and by the time it has attracted the attention of any one, it has been so long established that its progeny has started out like a horde of tramps, to live upon the farmers. It becomes necessary that each farmer, as a matter of safety, should know enough of plants, to be able to detect a new comer. We do not mean that he should be a botanist—though it would add greatly to the pleasure of his labors to know



WELL WITH CELLAR.—(*See page* 379.)

every plant he met—but his eye should be so accustomed to the forms of vegetation around him, and his powers of observation should be so educated, that he can at once notice any stranger that appears in his own fields, or in the neighborhood, for in this case charity does not always "begin at home." When a new plant appears, it should be at once challenged as to its origin and purpose, which may be best done by finding out at once what it is, or a shorter method may be followed by cutting it before it can mature seeds. We can not too strongly impress upon all cultivators the importance of at once attending to the case of every stranger plant. A human tramp gets a bit of the "bread of idleness," or at most steals some little thing, and is off to visit the neighbors; these plant-tramps generally come to stay, and to prevent you from raising bread, and instead of going to the neighbors, they send a stock of their abundant progeny, and, being social creatures, also provide for abundant companionship where they are. The N. Y. police frequently arrest suspicious characters, against whom no definite crime can be proved at the time; they take them into a gallery, and give them a forced sitting for their portraits, and the "Rogue's Gallery," which numbers some thousands of pictures of "hard cases," is one of the curiosities of the city to those interested in its criminal aspects. In a similar manner do we serve weeds of recent introduction, and by means of an engraving make their identification easy. The latest suspicious plant that has come to our notice is *Chondrilla juncea*, a native of a large part of the European Continent. It does not seem to have an English name, being unknown in England; the generic name, *Chondrilla*, is an ancient one applied to some related plant, if not to this, and is not translatable, but the French have modified the Latin name, and call the plant "Condrille," which will answer well enough for us. As will be seen by the engraving on the next page, the plant belongs to the Composite Family, and to that subdivision of it, which contains Lettuce and the Dandelion; indeed, the flower-heads are much like those of Lettuce. The plant is a biennial, with its root-leaves coarsely toothed; the stem, from one to three feet high, is stiff, with rather large branches, hairy below, and smooth above, with a few narrow leaves. The yellow flowers are in small heads, about half an inch across, scattered on nearly leafless branches; the pappus or down to the akenes (seeds) is very soft and bright white, each akene having a beak, at the top of which the down spreads like a little parasol, just as seen in the Dandelion on a larger scale. The plant seems to have been first brought to Alexandria, Va., where it was first discovered about ten years ago, and attracted no attention, except that botanists recorded its introduction. Since then it has spread, and is now found in various parts of Maryland; in some localities it has become thoroughly established, and we are informed by a correspondent that farmers are becoming alarmed at its threatening appearance. Being a biennial, the Condrille is easily managed; cut the stems before they flower, and it having no permanence by the root, will, if prevented from ripening seeds, soon die out. But seeds will scatter far and wide, and the whole neighborhood must aid in the work. We can not find that this plant is troublesome to European farmers, but its behavior there is no indication of what it will do here under different conditions of soil, climate, etc., for it is often the case that such plants develop much more rapidly here than at home. Whether it is likely to prove aggressive and troublesome, or not, it should be destroyed wherever it may appear, if only for the sake of neat cultivation.

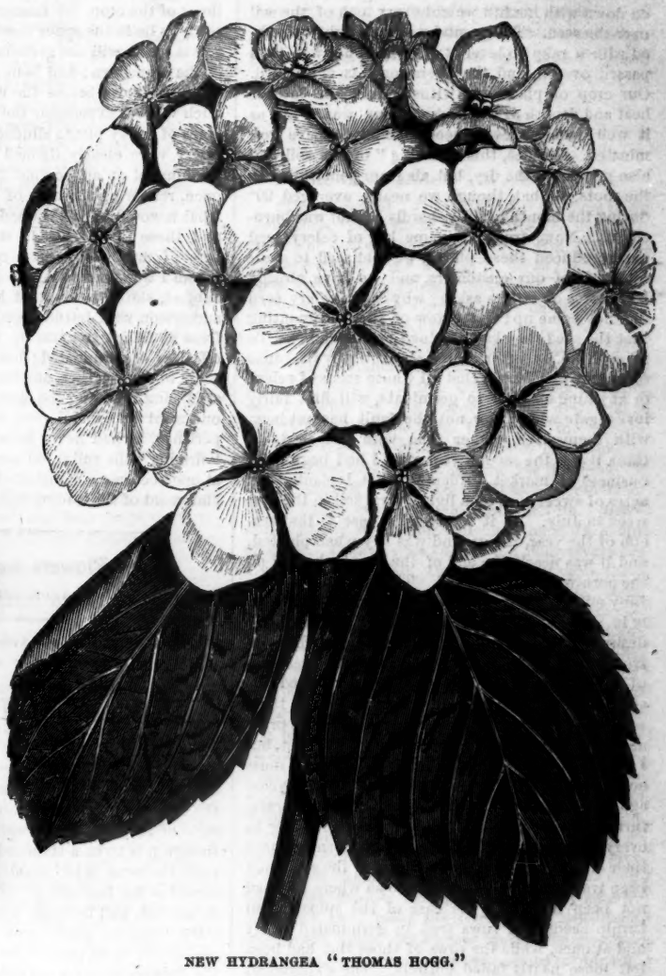


SELF-FEEDING CORN-CRIB.—(*See page* 379.)

The New Hydrangea "Thomas Hogg."

Those who concern themselves with the origin of the plants cultivated in our gardens and greenhouses, know that several of them are natives of Japan, and that many of the choice recent introductions have come from that country. The names of Fortune, Vietch, Maximowicz, and others, are well known as those of European collectors, who in recent years have added greatly to our horticultural treasures. There is an American, who, during two visits to Japan, one of them extending over seven years, has quietly sent home from time to time many valuable plants, and though plant-collecting was with him a secondary object, has added quite as many new plants to cultivation, as those who are more widely known. We refer to our friend, Mr. Thomas Hogg, of New York, a gentleman who shuns notoriety as much as others seek it, and of whom it is but simple justice to say that horticulture is as much indebted to him, as to any one for the choice Japanese plants that have been introduced within the last 15 years. One of the most valuable of the plants Mr. Hogg has yet sent home, is a Hydrangea, which he discovered during his last visit. Almost every one is familiar with the old garden Hydrangea, *H. Hortensia*, so named in honor of Queen Hortense, and not *H. hortensis*, as it is often written. This plant, introduced from China over a century and a quarter ago, is barely hardy at New York, but is usually treated as a house plant, to be put out in summer; it has enormous nearly globular heads of flowers, which are usually pink, but when grown in certain peaty soils containing much iron, are blue. The plant sent by Mr. Hogg, is a variety of this, but has its flower clusters of a pure white, while the individual florets are very large and of great substance. A wood engraving can not well show this variety as very different from the common garden Hydrangea, as its peculiarity depends upon color, (or the want of it,) and a texture, which an engraving can not reproduce. The engraving is made from a cluster borne by a recently struck cutting, the plant being hardly larger than the cluster, and serves to show the free flowering character of the variety. This must be very rare even in Japan, as Mr. Hogg, who has explored the country more thoroughly than any other foreigner, never met with but a single plant in all his travels, and this he came across in an old Japanese garden. Mr. H. sent this new Hydrangea to the well-known florist, Mr. John Cadness, of Flushing, L. I., in whose skillful hands it has been successfully propagated. Mr. Cadness exhibited specimens at one of the spring meetings of the N. Y. Horticultural Society, where it received especial attention from the florists present, who regarded it as of great value. White flowers of sufficient firmness to work into floral decorations are in great demand, and this affords an abundance of these, which may be used in masses, or the separate florets may be stemmed and worked in singly. We are informed that Mr. Cadness proposes to place the plant in the trade the coming fall, and we have no doubt its merits will be widely tested. As to the name, by which this variety is to be known, we need not tell any one who knows Mr. Hogg that it was bestowed without any agency of his, and while he was still abroad, but we can not wish the new Hydrangea any better future, than that it may prove to be worthy of being called "Thomas Hogg."

CONDRILLE.—(*Chondrilla juncea.*)



NEW HYDRANGEA "THOMAS HOGG."

The Use of the Feet in Seed-Sowing.

BY PETER HENDERSON.

For some years past I have, in writing on gardening matters, insisted upon the great importance of "firming" the soil over the seeds after sowing, especially at seasons when the soil is dry, or likely to become so. I know of no operation of more importance in either the farm or the garden, and I trust that what I am about to say will be read and remembered by every one not yet aware of the vast importance of the practice. I say "vast importance," for the loss to the agricultural and horticultural community from the practice of loosely sowing seeds in hot and dry soils is of a magnitude, which few will believe until they have witnessed it; and it is a loss all the more to be regretted, when we know that by "firming" the soil around the seed there is in most cases a certain preventive. Some two years ago I related in these columns how our crop of nearly two acres of celery plants was partially lost by neglecting to tread in the seeds, the dry heated air of May shriveling them and destroying their

vitality. Profiting by that lesson, I this season sowed two acres of celery seed (in quantity about 20 lbs.), the rows being about nine inches apart—"the marker" deepening the lines some two or three inches. After the man who sowed the seed, there followed another, who, with the ball of the right foot, pressed down with his full weight every inch of the soil over the seed. The ground was then lightly touched with a rake to level it, a light roller was then passed over it, and the operation was completed. Our crop of plants, notwithstanding the intense heat and drouth of the past summer, was as fine as it well could be, every seed seeming to have germinated. Besides, this "firming" of the soil had also prevented the dry, hot air from penetrating to the roots, so that, though we nearly averaged 90° during the month of July, hardly a plant was burned off. Now, from the same bag of celery seed that produced these plants, we sold seed to some hundreds of our customers, and we have already had scores of letters asking why their celery seed did not come up; not a few of them insinuating that the seed they had obtained was not good. To all such we, by letter, stated emphatically the cause of failure, and I trust that all whose seeds of celery or anything else fail to germinate, will first fairly investigate whether or not the fault has not been with themselves, rather than with the seed. I think it was the second year after I had begun the business of market gardening, that I planted six acres of sweet corn on a light, warm soil in the first week in July. As it is often the case at that season of the year, the ground was dry when planted, and it was nearly the end of the month before all the corn was above ground. The ground was carefully cultivated, but the whole operation was nearly in vain; as, before the corn had produced the desired "roasting ears," the crop was caught with frost and destroyed. Now, two or three pressures of the foot on each hill would have started the seeds at once, making a difference of two or three weeks in the maturing of the crop, and would probably have put a thousand dollars into my pocket, but I did not know the cause of failure then, nor, I must acknowledge, for many years after. Some years ago, as an experiment, I sowed seeds of beets, turnips, corn, and spinach, in July, treading in every alternate row. The beets and corn matured their crops in every instance where the seed had been trodden in, and failed to do so where this had not been done. In the case of the spinach and turnip seeds, the rows trod in germinated freely and at once, while the rows of those that had been left loose nearly failed entirely. The experiment was made with a view to show that beets of all kinds sown as late as the first of July, when the seeds germinate at once, have yet time to produce a crop, and sweet corn has time enough to produce its ears sufficiently mature for use in the green state, and furthermore to prove what I had long believed, that thousands upon thousands of acres of turnips fail from the want of "firming" the soil when the seed is sown. Of course if large areas are sown in turnips, the treading in with the foot might not be practicable; the next best thing is the roller, but that must be heavy enough to effect the purpose. As I have before hinted in the case of celery plants, the looseness of the soil not only prevents rapid germination, but even if germination does take place, and a long period of hot and dry weather follow, the young plant itself may be burned out, if the soil is loose, so that the dry, heated air can penetrate to the weak and tender root. This burning out after the seed has germinated, is sweeping in its effects on all seeds that are sown after midsummer, such as spinach, beets, turnips, etc., if the weather is dry and the soil loose. I beg to caution my inexperienced readers, however, by no means to tread or roll in seed if the ground is *not dry*. The soil may often be in a suitable condition to sow, and yet be too damp to be trodden upon or rolled. In such cases these operations may not be necessary at all, for if rainy weather ensue, the seeds will germinate of course, but if there is any likelihood of continued drouth, the treading or rolling may be done a week or more after the seed has been sown, if there is reason to believe that it may suffer from the dry, hot air.

Another very important advantage gained by treading in the seeds is, that when we have crops of beets, celery, turnips, spinach, or anything else that is sown in rows, the seeds to form the crop come up at once; while the seeds of the weeds, that are just as liable to perish by the heat as are those of the crop, are retarded. Such of the weed seeds as lie in the space between the rows when the soil is loose, will not germinate as quickly as those of the crop sown; and hence we can cultivate between the rows before the weeds germinate at all. Such was our experience the past season in the two acres of celery plants alluded to, as the rows of the celery were clearly defined before the weeds had germinated at all, so that the hoe was applied at once, rendering the cost of culture less than half what it would have been had the seeds of the celery and those of the weeds started simultaneously. One of my neighbors, a market gardener, with whom I was conversing on the importance of this subject, stated to me that he had failed thrice in succession with lettuce seed sown in July, either from its failing to come up at all, or being burned off after it germinated; but in every case he had sown in dry weather, and had failed to tread in the seed, simply rolling the ground. Although one of our most successful men, with long years of experience, he had never before adopted the plan of "firming" the soil upon seed in dry weather, but at once became convinced of its importance on my statement of the leading facts stated in this article.

How Flowers are Fertilized.

BY PROF. ASA GRAY.

ARTICLE VIII.—BEANS AND OTHER FLOWERS OF THE PULSE FAMILY.

In the course of an eloquent defence of a Salem sea-captain, charged with ill-treating and half-starving his crew, the late Rufus Choate electrified the jury by his eulogy of "that excellent esculent and superlatively succulent vegetable, the bean." We are to discourse upon the same topic, but not from the same point of view, nor in the grandiloquent style of the famous Massachusetts advocate. Although it is to be a standard dish in our present repast, the bean is too good, for our purpose, to be served at the beginning. We propose to bring it in at the end, and to begin with a papilionaceous or Pulse blossom, which ranks with the False Indigo and Clover as to plan of fertilization, that is, with the flowers we were occupied with in our last article. Clover-blossoms are individually small; so we take one of *Wistaria*, which is constructed on the same principle, only the flowers are in an open raceme instead of being crowded into a head, and the corolla is not lengthened and consolidated below into a tube.

Fig. 1 represents a *Wistaria* flower. The large upper petal turned back away from the rest is named the standard; the two side-petals below are the wings; the boat-shaped piece between the wings is called the keel. This consists of a pair of petals, joined together along the lower side — where the keel would be if the whole thing were a boat, but free and a little open at the upper edge. This keel completely encloses the stamens and pistil. There are ten stamens; nine with filaments united up to the curvature into a sheath split along the upper edge,

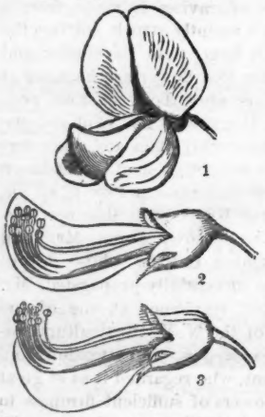


Fig. 1.—*Wistaria Sinensis blossom.*—Fig. 2.—*Side view with all the petals except one-half of keel removed.*—Fig. 3.—*Same with keel depressed by the weight of a bee.*

where lies the separate tenth stamen (figs. 2 and 3. The pistil is enclosed in the sheath; the tip of the style, and the surmounting stigma, may be seen, on close inspection of fig. 2 and fig. 3, among the anthers. Fig. 4 is an enlarged representation of the stigma, (the little knob at the tip surrounded by a little fringe of bristles), the style, and the upper half of the ovary or forming pod. The anthers surround the stigma and—unless the minute fringe has some effect—there is nothing to prevent the pollen from falling upon the stigma. Like Clover and *Baptisia* it surely may self-fertilize, and the wonder is that it does not universally or generally do so.

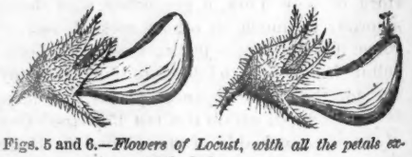
Fig. 4.—*Pistil of same, lacking the lower part of the ovary, enlarged.*

But bees and other flying insects visit all these flowers; and in *Wistaria* the mode of approach and operation is nearly the same as in *Baptisia* or False Indigo, already described. The bee, with head approaching the center of the flower, to insert its tongue down at the junction of the standard and keel, alights or partially rests on the latter. Untouched, it is in the position of fig. 2, the weight depresses it to that of fig. 3, and so lets the abdomen of the insect plump down upon the now protruding anthers and stigma. The first flower so visited simply deposits a quantity of pollen upon the under side of the insect's body. The next, brushing its stigma over some part of the pollen-covered surface, gets fertilization from the pollen of the preceding flower, and at the same moment gives a fresh supply of pollen, of which the next flower visited gets the benefit, and so on. In any instance, the stigma may get some own-flower pollen, and be self-fertilized; but it is equally or more likely to get the pollen of other blossoms, and so be cross-fertilized. We cannot be far wrong in assuming that all this is meant for cross-fertilization either generally or occasionally.

In all such flowers the insect does not usually alight or press upon the keel alone, but upon the wings and keel together, or upon the wings only when these are large in proportion and cover the keel. But the two are locked together toward the base, so that pressure upon the wings depresses the keel all the same, and produces the effect.

From such papilionaceous flowers in which cross-fertilization must be frequent, let us pass to those of the same family in which it is made sure. There are all gradations, and many ways of doing the thing, showing an exhaustless fertility of contrivance. Probably not half the ways are known yet in this well-known and familiar family of flowers, I will here illustrate only two of them, and leave a third for a future article. In both the cases now in hand, the pollen is transferred to the style underneath the stigma as soon as the blossom opens, or even earlier—so far in the fashion of the Bell-flowers, described in our first article. Peas and Beans are our examples.

Instead of Pea, we take a Locust-blossom, because it is simpler to represent. There is a complication and twisting of the style in the common Pea which is not quite so easy to show clearly in a wood-cut, but the contrivance is the same. Locust-blossoms are so like those of *Wistaria*, (shown in our figure 1,) that there is no need to give a separate drawing of a whole one. Figure 5 shows one with the standard and wings taken away, the keel only remaining. Figure 6, the same when the keel is pressed down by the alighting of a bee on the wings, which are large and broad. Only the end of the style, with the stigma at its tip, projects; the anthers remain within. This projecting tip strikes



Figs. 5 and 6.—*Flowers of Locust, with all the petals except the keel removed.*

against the abdomen of the bee, which, in the oblique movement, is hit first by the stigma, and then

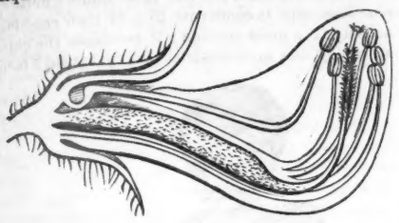


Fig. 7.—*Same as fig. 5, cut through and enlarged.*

by the part of the style just beneath. Now this is furnished with bristly hairs, thickly set, in the manner of a bottle-brush. To see this clear by itself we must look into a flower-bud. Figure 7 shows one like figure 5 cut through. Five of the still unopened anthers are seen; and the style with its brush in the center. Figure 8 shows the same style from an open flower. The difference is that the brush is loaded with pollen. The anthers have discharged their contents in such a way that almost the whole is borne by the beard of the style. So, when a bee visits a flower and depresses the keel by his weight, he brings some particular part of his hairy abdomen first against the stigma, then against the pollen-loaded brush. Some of the pollen so transferred from the hairs of the style to the hairy surface of the bee's body, is certainly transferred to the stigma of the next flower visited, a fresh charge of pollen taken to be bestowed upon the next flower, and so on. It is as neat and as sure as a printing-press, in which the types are first inked by the roller, and the ink thence transferred to the paper.

Fig. 8.—*Style from the same taken later, its brush loaded with pollen.*

The contrivance in Beans (*Phaseolus*) is similar, with a difference. In the country, in the writer's boyhood days, not "to know beans," was the current expression for uttermost ignorance. Here is something about beans which, it is safe to say, few of those brought up among them even yet know. The blossom is on the same plan as that of Pea, Locust, and the like, (see fig. 9); but the standard is smaller; the wings more horizontal and projecting; the keel long, narrow, turned up toward the center of the flower, and (if a bucolic comparison may be permitted), curled up after the similitude of a pig's tail. Figure 10 shows this, apart from the rest of the flower, and enlarged. How the pistil is coiled up within this is shown in the section of the same, more enlarged, (fig. 13); the stamens are left out, for clearness. Note the style, with the stigma set obliquely at its tip, and below it for some distance the brush of hairs, mainly on the same side as the stigma. This figure, taken in the unopened flower, shows the brush free from pollen. But the anthers shed their pollen just when the flower is about to open; and somehow this pollen mostly, then, gets packed upon the brush, so as to be as in figure 14. Now for the operation. Stamens and pistil lie concealed in the coil; the stigma just within the open end; the anthers a little farther back, but in the open flower already empty and withering. Press down the wing-petals gently, as is done in figure 11; these, being locked at the base with the keel, act so as to depress the coil of the style within, and out pops the stigma and its pollen-laden brush; withdraw the pressure and back it goes to its hiding place. The separate keel, greatly enlarged with the protruding stigma and brush, is shown in figure 12. When the pressure is made by a bee, searching for honey within the base of the flower between the keel and the standard, the same movement takes place; the stigma first, and then the brush, strikes against a certain portion of the front or side of the bee's body, and so brings about the fertilization of each blossom by some other than its own pollen. The machinery tells its own story plainly. The confirmation is familiar to all who "know beans" and their facility of mixing when different varieties are grown together.

Fig. 9.—*Bean-blossom.*

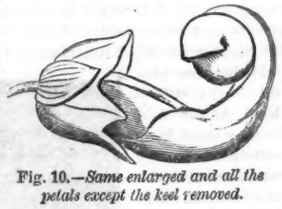


Fig. 10.—*Same enlarged and all the petals except the keel removed.*

Fig. 11.—*Same as 9, with the wing-petals weighed down, and stigma and brush protruding.*

Fig. 12.—*Keel from the same enlarged.*

Fig. 13.—*Enlarged section of the keel, showing the pistil within, before the anthers open.*

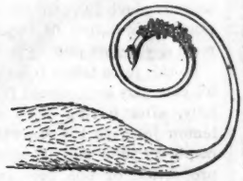


Fig. 14.—*Same pistil after the discharge of the pollen upon the brush of the style.*

Lilies from Seed.

In discussing the subject of Lilies with Anthony Waterer, Esq., the well known English nurseryman, we learned from him that the same trouble had been found with the Gold-banded Lily, *Lilium auratum*, in England, that has been experienced here. We have more than once referred to the fact that though thousands upon thousands of *Lilium auratum* bulbs had been imported and sold here, we rarely saw an established bed out of all that have been planted. The experience has been the same in England as here; the bulbs throw up a small flower stem, produce one to four or five flowers, the stem dies down, and the next year fails to appear altogether, or a few weak shoots come up; upon digging the bed we find that all the large bulbs have disappeared, leaving in their place others not larger than hickory nuts. Mr. Waterer informs us that he had no success with *L. auratum* until he grew his own bulbs from seed, and that he now has several acres in this lily, raised from both seeds and scales, the bulbs of which can be as much depended upon as those of any other lily. In his favorable climate and soil, he gets good flowering bulbs in three years from the seed. We have never seen this grand lily in perfection, and probably our climate will not allow us to do so; Mr. W. states that he measured one stem *eleven feet* high, and it had 135 flowers upon it. This far surpasses anything we can hope to equal, and we shall be quite content if we can get our poor half-dozen blooms, and can depend upon holding on to the bulb year after year. Knowing the impatience of our flower growers, we are sure that few will be content to wait during three years from seed to flower, and we can not in this country hope to get flowering plants as soon as that. Still, to those inclined to try raising this and other lilies from seed, we would remind them that the sowing should be made as soon as the seed is ripe; if kept until spring it rarely germinates, and the plants, whether young or old, should have abundant shade.

KŒLREUTERIA PANICULATA.—It seems to be a great pity that a tree with so many elements of popularity as this, should be so little known. We have several times called attention to it, and shall probably do so several times more, for we can do lovers of neat, pleasing trees no better service. The dark green, handsomely cut foliage is remarkably clean; we do not recollect to have ever seen an insect upon it. The flowers are abundant, light yellow, in pyramidal clusters; and the large, bladdery pods are quite showy. The tree grows readily and rapidly from seeds, which the dealers in tree seeds supply in small quantities, if desired.

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

Home Topics.

BY FAITH ROCHESTER.

What does a Mother's Work Include?

I often plead for a fair chance for mothers to do their work, and I know well that some who hear me or who read my words, have little sympathy with my earnestness. If a woman manages somehow to keep her children tolerably well fed, clothed, and schooled, and as healthy as most children, what would she have more?

She would have their companionship, their intimate acquaintance and friendship. She would gladly do for her children what only a good mother can do, with the best success. The dress-maker and tailor can clothe them for money, hired cooks can feed them, professional teachers can attend to their arithmetic and spelling, and yet there may be left a plenty of mother work and care. I remember well a young mother whom I met before I had a family of my own. She had but one child, a boy of three. It struck me then that I had never seen a real mother before, the relation between these two was so much more perfect, and so much more natural, than any I had seen before between parent and child. She was not all absorbed in her child; she did not think him perfect, and did not worship him. She worked for the Sanitary Commission, and had a hearty interest in the general affairs of the day. But every step of her child's progress was interesting and important. The tendency of his pastimes, and the influence of his play-mates were thoughtfully considered. The instinctive workings of his mind were studied, in the hope of being able to meet his growing intellectual and moral needs. His daily habits were guarded, so that he might early get a healthy bent, and lay a good foundation for a healthy and vigorous manhood. His mother played with him, and read to him, and gave good heed to all his questions, though she might not answer them until a proper time came, or perhaps not at all. Most people who knew her, may have noticed only that she enjoyed her child's society, without thinking what she was doing for him. A few knew that it was a reciprocal education of incalculable benefit to both mother and child. Her mind was at liberty to make her child's culture her chief business. When I knew her she had very few household cares, and she allowed society to make no heavy demands upon her time and thoughts. She said that nothing amazed her more than to see that mothers generally were not *acquainted* with their children, and did not seem to realize the fact.

To show what some mothers are thinking about, I will quote from a recent letter from the playmate who was my chief partner in the mud-pie business, over thirty years ago. She says: "But when a mother has to hurry up from her sick-bed, and begin to turn baby off, and wish and watch for his nap, so that she can fly around and do as much work as can be crowded in, and say 'O dear!' when the nap is over, and turn off the other children because she 'can't spend time,' it's *all wrong*. O. gives me a lesson once in a while. She believes in children having a good time, whether 'the work' is done or not. She was here, and G. was teasing me to go down to the river and throw stones, and I said 'I can't spend time. I'm in a hurry.'—O. said, 'Aren't you ashamed! Only one child and can't take time to please him by going to the river to play a little while!'—Then she made me promise to go up to her house with G., and not to take a stitch of work, but just roam around or go fishing, or do anything we wanted to."

I have lately had some refreshing talks with a

New England mother, who had been absent from her family for several weeks. I saw how she was treasuring up every idea that came to her for the improvement of her children. She sought to inform herself on all points that would make her a more useful companion to them, and enjoyed planning her work for them when reunited to them once more. It seemed to her that she should manage somehow to give them more of her personal training and society, than she had given them before her sickness and her journey, and she was in search of books suitable for reading with them, and gave considerable study to her choice of presents which would have the best effect upon each one.

Of course it is possible to fuss over children too much, and there is such a thing advisable as "judicious letting alone"; but it ought to be possible for enlightened mothers to follow their best judgment in each case. Schools and classes, especially kindergartens, are great helps, no doubt—indeed they are necessary to the broadest development of character—but they can never take the place of good home education. If a mother has not time to read with her children, to play games with them, to supervise their employments, to sympathize with them in their enthusiasms and disappointments, it is a great pity, and a remedy should be sought.

Jelly and Marmalade Making.

I remember how difficult a matter it used to be, among most of the housekeepers familiar to my childhood, to make jelly "come." You would see jars and tumblers of thick red fluid sitting in the sunshine, waiting for the sun's rays to evaporate the excess of water, and change the fluid into jelly. You would hear housekeepers apologizing for their gummy jelly, by explaining how they had to put it over the fire a second time and boil it down, thus thickening the fluid, but not making successful jelly. Other housekeepers said they never had a bit of trouble in making good jelly, being very particular to take the fruit when first fairly ripened, and when freshly picked and dry. They were also careful to observe exact weights and measures. Jelly can be made from any fruit or vegetable, from which can be obtained the peculiar substance or principle called *pectine*—so called from a Greek word meaning *curdled*. This can be obtained not only from currants, grapes, apples, plums, quinces, and other fruits, but from turnips, carrots, beets, and other roots, flavored in each case by some other principle peculiar to each fruit or vegetable. Jelly is commonly made by mixing sugar with the fruit juice, but usually the quantity of water in the juice must be reduced by boiling or by the action of sunshine. If boiled too long, it loses its power to form jelly, and becomes gummy. Boiling the sugar with the fruit juice longer than is necessary for its perfect mixture, spoils the flavor, or makes the jelly more bitter and less clear in appearance, than when the sugar is put in after the juice has been boiled sufficiently alone. To prevent the necessity of boiling the juice and sugar together, the most careful housekeepers now put the quantity of sugar necessary to make the jelly they are preparing on plates in the oven, letting it get as hot as possible without burning it while boiling down the juice. The plan is strongly recommended by Marion Harland, who says she has practiced this for twelve years without a single failure. If too little sugar is used, the jelly will not stiffen without over-boiling, which spoils both texture and flavor. Recipes for jellies often direct us to "simmer in a little water," until soft enough to strain through the jelly bag. This is not necessary, and by the addition of water longer boiling is required. It is only necessary, in order to get the juice of the fruit set free, to steam it well. This may be done by setting the clean, dry fruit over a kettle of boiling water in a covered pan. If a tin pan is used, it must be bright and unworn. A rusted or blackened tin, or an iron spoon, would injure the flavor of fruit. Or a stone jar, containing the fruit, may be set in a kettle of cool water, and boiled until the fruit-cells are broken and the juice set free. Put a block or a small dish under the jar, so that it will not break when the water around it begins to boil, and do not fill the kettle so full of water as to make it boil over into the fruit. The jar should be kept covered. A *new* tin steam cooker answers well for making jelly, though a stone jar is perhaps the nicest. Brown sugar is as good as white for making jelly, except that it gives a darker color. The usual proportions given are "a pound of sugar to a pint of juice," but a little less makes better crab apple jelly, in my opinion.

All this talk about jellies comes too late for currant and berry jelly this season. One "kink" about making strawberry jelly I may mention here, however. You can make your jelly from the same fruit that you use for canning, if you follow Marion Harland's directions for "canning berries." Under that head she says, "Heat slowly to boiling in a large fruit kettle. When they begin to boil, add sugar in the proportion of one tablespoonful to each quart of fruit. Before doing this, however, if there is much juice in the kettle, dip out the surplus with a dipper or cup. Leave the berries almost dry before putting in the sugar."

So this juice taken from the berries which go to fill your jars as "canned fruit," makes your berry jelly, after having been strained. Add a little lemon juice to the strawberry juice, and to your raspberry juice add, if possible, currant juice in the proportion of one part currants to two parts of raspberries. Then observe the general rule of pound for pint, boil twenty minutes before adding hot sugar, and only two or three minutes afterward.

Beautiful jelly can be made from the wild plums, so plentiful in some parts of the West, and nice marmalade can be made from the same fruit.

Wild Plum Jelly.—Pour boiling water over your plums, turning it off immediately—this is for the purpose of extracting the bitter taste in the skins. Steam the plums in a stone jar or covered pan over boiling water, until they crack so that the juice runs out. Put them into a colander and let them drain, but do not press them. Boil this juice twenty minutes, meanwhile heating the sugar on plates in the oven (pound for pint) so hot that you cannot bear your hand in it. Put the hot sugar into the boiling juice, and boil all together a few minutes.

Plum Marmalade.—Rub the plums, after draining, through a sieve or colander, to take out the stones and skins. Add half a pound of sugar for each pint of pulp, boil slowly, stirring well to prevent burning, until it is a smooth, thick paste.

Excellent marmalade is made by mixing the sifted pulp of wild plums and crab apples.

Crab Apple Marmalade is made like plum marmalade, after sifting the steamed apples through a colander. Do not pare the apples, but only cut out the blossom ends. Half a pound of sugar to a pint of pulp. Boil until you have a clear thick paste.

Crab Apple Jelly.—Cut out the blossom ends and quarter the apples, but do not peel or core them. Put into a stone jar, covered well, and set in a kettle of tepid water, with a block or small tin in the bottom. Let it boil thus nearly all day, leaving it in the covered jar until the next morning. Then sift through a colander, and afterwards strain through a jelly bag. Allow a pound of sugar for a pint of juice. Boil the juice twenty minutes, add the *hot* sugar, stirring well, and let all boil up together two or three minutes. Some crab apples seem very dry and require the addition of a little water to the juice.

Wild Grape Jelly.—Gather the ripe fruit before frost, or while it retains all its acidity. Steam (without water) in a covered jar set in boiling water, until the grapes are well broken up. Strain through a colander, then through a jelly bag. Boil the juice alone twenty minutes, and add a pound of sugar for each pint of juice. Have the sugar *hot* when put in, stirring carefully. Boil all together two or three minutes.

The Kindergarten Gifts and Occupations.

The Kindergarten system for the education of children, has been more than once referred to in these columns. The name, meaning "Child-gardens," was given by the originator, Frœbel, because children were *cultivated* rather than taught. We cannot go into a detailed account of its principles and methods, but state briefly that the Kindergarten is founded upon the fact that children must *do something*, and it endeavors to turn their ceaseless activity to a good account; it furnishes the child with play, and so directs that play that it shall form

Fig. 1.—OCCUPATION OF STICK-LAYING.

a part of the child's education. It is intended for very young children—even beginning before the child can leave the constant care of the mother, and goes on until the child is old enough to be taught from books and in a regular school. When the system was first introduced it made but slow progress in this country, but a few appreciative minds—among them notably Miss Elizabeth P. Peabody—saw its capabilities and persisted in advocating it; now, after a healthy growth, the Kindergarten may be regarded as thoroughly established. In proof of this may be cited the advertisements of the numerous Kindergartens in the columns of the daily papers, and the fact that in some cities it has been engrafted upon the common school system. While we had a general notion that this system of education was now accepted and advocated by the best teachers of youth, we had no idea of its extent until we recently made a visit to the book-store of Mr. E. Steiger, Nos. 22 and 24 Frankfort st., N. Y. This gentleman has for a long time made a specialty of Kindergarten literature and materials, and publishes catalogues of both. The works in English, German, and French, are surprisingly numerous, and there are several journals devoted to Kindergartens both in this country and Europe. Those who are interested in knowing its aims and means—and every mother should be—can send to Mr. Steiger for the Kindergarten tracts which he publishes for gratuitous distribution. As the child at play must have something to *play with*, Frœbel devised a series of playthings which he called "gifts" and "occupation material," to keep little fingers busy. These are regularly graded, and are to be used successively according to the development of the child. The first gift, to be used while the child is still in its mother's arms, consists of soft balls of different colors, each with a string by which it may be swung, and a box in which all may be kept. With these the child learns up and down, in and out, here and there; the use of the gift being accompanied by a little song, or verses, which can not fail to amuse the little one, and at the same time teach it many object lessons. From this simple gift, the series runs through various ingenious and pleasing forms up to the 20th, in which the child is given a modeling knife and a ball of clay or putty, and allowed to work various forms out of a shapeless mass. The manufacture of the gifts,

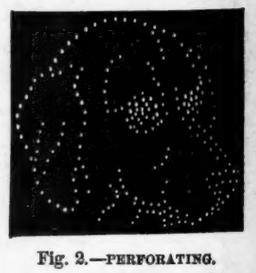


Fig. 2.—PERFORATING.

which, though all very simple, must be exceedingly neat and accurate, forms a large business of itself; the articles are put up in boxes for use in the family, and are accompanied by directions for the parent; they are also supplied to kindergarteners—as the teachers are called. Where there is no established Kindergarten, the same method is of the greatest help to the mother, and special sets are made for family use. To give some idea of these various occupations, we present some engravings which illustrate them. Figure 1 shows Frœbel's eighth gift: sticks for Stick-laying. A box, with compartments, contains 500 round sticks, like those used for parlor matches, and 1, 2, 3, 4, and 5 inches long. The child amuses itself by laying these upon a table to form various figures, either following its own fancy, or the numerous plates of designs that accompany them. An advanced child can readily make the letters of the alphabet with these sticks. Another occupation is Perforating or Pricking; the gift consists of a number of sheets of paper ruled in squares, a cushion of felt, perforating needles with handles, and numerous designs. This serves to educate the hand and the eye, and the child progresses from pricking simple lines and squares to more irregular and difficult designs, such as that shown in figure 2. When some skill is acquired,

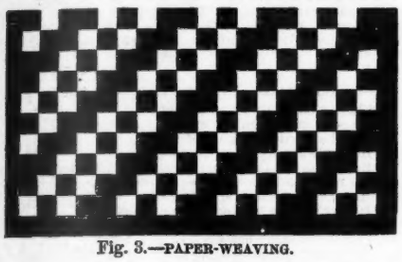


Fig. 3.—PAPER-WEAVING.

thicker paper may be used and the perforated pictures mounted for preservation or to use as screens, or parts of fancy boxes. The occupation of "Paper Weaving" is provided with strips and "mats" of glazed paper of different bright colors. The mat is a sheet of paper cut regularly, but not quite to the edges, making a warp into which the strips are worked by means of a weaving needle which catches the end of the strip and allows it to be pulled through, under and over the strips of the mat. Figure 3 shows a specimen of the weaving, which is capable of great variety, and allows of original designs. One of the most curious of the gifts consists of pieces of wire of various lengths, pointed at the ends, and a lot of peas. The peas are softened by soaking several hours in water, and by means of these and the wires a great variety of skeleton forms, like that in figure 4, may be built up. Little cubes of cork are sometimes used instead of peas, as shown in the engraving, and the sticks, used for stick-laying, may have their ends pointed and replace the wires. These are but four out of the 20 different occupations and gifts, but are sufficient to show how admirably play may be made to develope the child's faculties, and form a most valuable foundation for its future education.

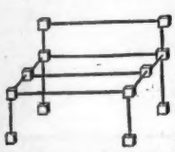


Fig. 4. PEAS & WIRES.

Mangles old and new.

A mangle as a household convenience is so little used in this country that the majority of persons have only an indefinite notion that it is something for smoothing linen, but what it looks like or how it works they have no idea. In hotels, hospitals, laundries that do steamboat washing, and such places, the smoothing of sheets, table cloths, towels, and the like, by the use of the ordinary flat or sad-iron would be very slow work, and in such places the smoothing is expeditiously and sufficiently well done by the use of a mangle. In its original form the mangle was a most cumbrous and unsightly affair, and was probably derived, with its name, from Holland, *mangelen*, being the Dutch name signifying to smooth with pressure, as well as to cut up promiscuously and mutilate. The machine consists of a smooth wooden table, upon which are two smooth rollers; upon these rests a large wooden box, which is so arranged with gear-

Fig. 1.—A FAMILY MANGLE.

ing, that by turning a crank the box is pushed back and forth. The linen being placed upon the table, the rollers, as the box is moved back and forth, pass over it and smooth it; in order to give the necessary pressure the box is filled with stones, and the weight brings the rollers down upon the cloth with great force. The machine takes up nearly as much room as a farm wagon, and to operate it requires a strong arm. When we have seen one of these unwieldy mangles in operation, and seen how useful it was in spite of its ungainly looks, we have wondered why some one did not invent a machine which would do the work with less labor, and not take up more than a third of the room, and have long been convinced that whoever would provide a compact and efficient mangle for use in the family, would not only confer a blessing upon housekeepers, but reap a satisfactory reward. This much-wished for end the "Standard Laundry Machinery Company" of Boston and New York claim to have accomplished. This Company makes washers, wringers, mangles, and whatever may be needed to fit up a complete laundry, and present a fine array of testimony from those who have used them, as to the efficiency of their machines. The mangles are made of different sizes and styles, to be operated by power or by hand; an engraving of one of

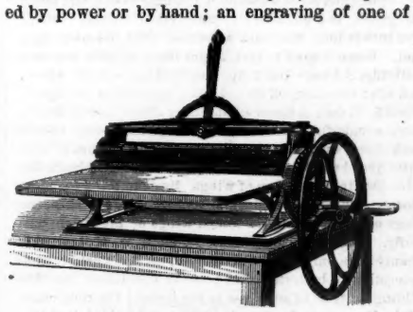


Fig. 2.—IMPROVED MANGLE.

the hand machines is given in figure 1; the damp linen being properly folded passes, when the crank is turned, between heavy rolls of polished metal, which are so arranged that the pressure may be regulated according to the material. In figure 2 is shown an improved form of the mangle, which may be fastened to a table. The smoothing being done entirely by pressure, it is claimed that linen and cotton goods last much longer when mangled, than when frequently smoothed by hot irons—an item of no little importance.

Potatoes in Kentucky Style.

Our potatoes turned out a small crop of small potatoes; more than that, they were treacherous, and though they came to the table looking fair without, they were often dark within, and not to be eaten. One day a new dish appeared in place of the usual plain boiled or mashed potatoes. Everybody pronounced it good by being helped at least twice. Upon inquiry of the presiding genius of the kitchen, we found that she learned the way of some Kentucky people, and the way is this: The potatoes are sliced thin, as for frying, and allowed to remain in cold water for half an hour. The slices are then put in a pudding dish, with salt, pepper, and some milk—about half-a-pint to an ordinary pudding dish. They are then put into the oven and baked for an hour. When taken out, a lump of butter, half the size of a hen's egg, is cut into small bits and scattered over the top. Those who have never eaten potatoes cooked thus, do not know all the capabilities of that excellent esculent tuber. The slicing allows the interior of each potato to be examined, hence its value where potatoes are doubtful, though poor ones are not of necessity required. The soaking in cold water hardens the slices, so that they will hold their shape. The milk serves to cook them through, and to make a nice brown on the top; the quantity can only be learned by experience; if just a little is left as a rich gravy, moistening all the slices, then it is right. In this year of small and poor potatoes, this method of serving them will be very welcome to many a housekeeper. The only trouble about it is, that every one will eat twice as many as when the potatoes are cooked in the ordinary way.

BOYS & GIRLS' COLUMNS.

The Doctor's Correspondence.

Well, here is quite a menagerie! The animals, it is true, are small, but if we judge them by the damage they do, they are quite as important as larger ones, and their ways of living and getting along in the world, are more wonderful than those of the others. You have guessed that I refer to insects. My advice to study the ways of insects has been followed by some youngsters, and even some of the parents of the young people have sent their inquiries to "The Doctor." All right, the more the better, only if the older people send their questions to me, they must expect to find them answered just as if they came from the boys and girls.....Here is master "H. W.," who writes from Mt. Sterling, Ill., that "some things" are injuring the leaves of his "Centennial Elm," and he wishes to know what they are. He sent them in his letter, and all that I find are some very unpleasant looking, shapeless spots, and I can not make out any form whatever. I am very sorry, as "W. H." calls them "curious things," and I should like to know what they are myself. If the "things" had been sent in a little box of tin or wood, they would have come all right. I must tell you

HOW TO SEND INSECTS,

and other small things that would be crushed in a letter. A little box is the handiest; it should be quite strong, which paste-board boxes seldom are, and only tin or wood are sure. But boys who live on a farm, do not always have such boxes handy, while they are too far from shops to get them, and they will be glad to know of a way, by which they can do quite as well without. Take a piece of pine or other light wood, and with an augur or bit bore a hole not quite through it; then you can cut away the wood around the hole, so that it will not be too heavy, and not so much that it will be too weak. Put your insect, or other little thing into this, put in a cork, and you will have a box, which, if not so neat as some, will answer perfectly.....There came the other day a lot of twigs of the Larch tree, to which were hanging a number of curious objects, like that shown on the next page in figure 1. I do not wonder that the one who found them was puzzled, but had he cut open a bag, he would have found inside of it a very active, blackish looking caterpillar. The insect is known as

THE BAG OR BASKET-WORM,

and also Drop-worm, though it is not a *worm*, except to those who give that name to all caterpillars. When the little caterpillars hatch out from the egg, they begin to spin a bag; when very young, they are found upon leaves, walking upon their forward feet, with their tails stuck up in the air, around them is the bag, to which they fasten little bits of leaf. As they grow, they add to the bag, and after a while this gets so heavy that instead of holding it up into the air, they let it hang down. The bag is brownish, and they fasten to it little bits of twigs, probably all the better to deceive the birds, and by the time the caterpillar is full grown, its bag is of the size and shape shown in the engraving. In Mexico there is a horribly thorny shrub, upon which a related Bag-worm lives, and it covers its bag with thorns, put on with the points outwards, in such a manner that no bird would think of touching it. These caterpillars move along on the twigs of a tree, hitch their case fast until

they have eaten all the leaves within reach, (some at least feeding only at night,) and then cut away their fastening, and move away to another spot. They are not very particular as to food, but will live upon almost any tree. When full-grown, the caterpillar fastens its bag very securely to a twig, and then goes into the pupa state, and finally the male comes out as a little moth, with a black body and glassy wings. The female never comes out, but makes the bag her coffin; she lays a great lot of eggs, and dies there; the bag containing the eggs hangs upon the tree all winter, and in spring the young hatch out to eat more leaves, and weave more sacks. They are sometimes very numerous upon shade trees, and injure them very much. The only way to get rid of them is to pick them off. Those found upon the trees now are either the empty cases of the males, or those of the females, almost filled with eggs, and if the sacks of eggs are taken off before spring, it will save much trouble. It is said that there is a Bag-worm in the West Indies, which makes a sack six inches long!....A few years ago, as I was drawing a bucket of water from the well, an enormous Bee went by my head with a *whoom!* into the curb, and disappeared; how so big a bee could get out of sight so quickly, puzzled me, and I watched. At length another came, and I being on the look-out, saw that it suddenly popped into a hole in one of the boards of the well-curb. Here, thought I, is something that will please the boys and girls, but the old curb was taken down and destroyed, while I was away from home, and I missed the chance of examining the nests. This year the same kind of bees are at work in a small porch that is over a cellar door, and they have bored holes as neatly as a carpenter could. Indeed, these insects are called

Fig. 1.—BAG-WORM.

CARPENTER BEES,

and this particular one the Virginian Carpenter Bee; it is of the size shown in figure 2, and is much larger than the common Bumble Bee, but being much less hairy, its body does not look much larger. The bee usually bores, by means of very strong jaws well formed for cutting, into the edge of a board, and when she (for the females do this) has a hole across the grain, about her own length, she turns and cuts the rest of the hole with the grain of the wood. You may be sure that she does not turn carpenter for amusement; she is really building a nest to provide for her young. The hole is about half an inch wide, and from four to five inches deep. As I could not well tear down the porch to get at the board in which the bees were at work, I have borrowed the engraving, figure 3, from Mr. Packard. This shows one of the holes cut through, so that you can see the inside. The bee puts an egg into the bottom of the hole, and then provides food for the young grub that will hatch from it, for you must know that bees, like butterflies and beetles, when just hatched, are larva or grubs, and only turn into perfect insects after they have made their growth. The food of the young or grub bee, is pollen, the dust of flowers, such as you see in such abundance in lilies; this the mother bee collects, and makes into a ball, giving each egg a lump as large as a common bean. The egg and the food being ready, the bee then takes the chips she has made, sticks them together with saliva, and builds a partition quite across the hole; she then puts in another ball of pollen, lays another egg, and shuts this in with a sawdust wall in the same way. When she is through, the hole or tunnel is divided across, as shown in figure 3, into cells, not quite half-an-inch long, each the home of a little grub.

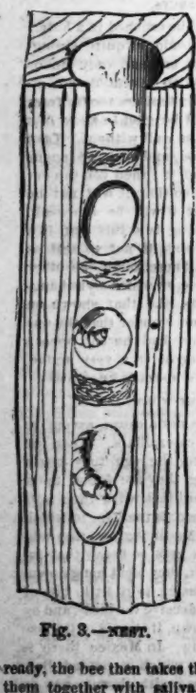


Fig. 3.—NEST.

Fig. 2.—CARPENTER BEE.

The lower two cells in the engraving show the grub hatched out, and feeding on its pollen ball. After the grubs get full grown, they then go into the pupa state, and finally come out as full sized bees. Other carpenter bees bore into shrubs, such as the blackberry and elder, and if you keep a sharp look out, you may find more than one kind....The other day there came from New Hampshire a little box, in which was packed in cotton something that might well be taken for

A BEAUTIFUL JEWEL.

Nothing among the costly jewels at the Centennial, can be more truly beautiful than this, and yet it was only one form of a rather common insect. Figures 4 and 5 are two views of this "jewel," of real size. You must imagine it to be of the most delicate clear pale green, of a color only seen in some rare minerals, such as jade; then it is hung to a twig by the blackest of all black little stems; at the widest part there is a row of golden dots, placed closely together, and as if to make them show all the more brightly, there is just under them an intensely black line, and below these are a few scattered golden spots. When I say golden, I do not mean merely yellow, but shining with exactly the luster of the metal, and much more like real gold than much of the cheap jewelry that is worn. Of course the spots are not gold, nor is there any metal about them, but the effect of the skin upon the light, produces that appearance. This beautiful object

Figs. 4 & 5.—CHRYSALIS OF ARCHIPPUS BUTTERFLY.

is the pupa or chrysalis of the common Archippus butterfly. The caterpillar feeds upon the milkweeds, and when full grown, is a black, white, and yellow "worm," about two inches long, and with a pair of black horns at each end. When it goes to rest, to get ready to come out as a butterfly, it hangs itself up, doubles into a small space, and after throwing off its old skin, appears as in figures 4 and 5. I do not know of anything about insects that is more wonderful than that such a large caterpellar should pack itself away in so small a space, or that out of this little jewel should come an orange and black butterfly, with four inches spread of wings. By examining the pupa closely, you can see under the half-transparent skin, the rings of the body and the folded wings of the future butterfly. Another thing strange about it is, that all this beauty lasts only for about 10 days, for the change from caterpillar to butterfly takes place in that time. All this gilding must be of some use to the insect; the rough case of the Bag-worm deceives the birds, and I think that this green and golden pupa case must so astonish the birds, that they stop to admire it and forget that it may be good to eat. In some parts of the country these butterflies are so numerous that it is said that there are sometimes *millions* of them in swarms. How wonderful to think that each one of these came from such a beautiful case as I have described!

The talk about insects has taken so much space that the other letters must wait. Do not think that questions not answered at once are lost or forgotten. I have a nice "pigeon hole" in my letter case which is marked "B. and G.," and all your letters are safely kept until I can find it convenient to reply.

Aunt Sue's Puzzle-Box.

WORD PUZZLE.—ACROSTIC.

My first signifies "the grace or mercy of The Lord."
My second signifies the same as Joshua, "a saviour."
My third signifies "a rose."
My fourth signifies "a cluster of figs."
My fifth signifies "made of stone."
My sixth signifies "rewarded."
My initials form the name of a river called "River of Judgment. My finals for the name of a man signifying "Beautiful." J. E. G.

NUMERICAL ENIGMA.

4, 5, 6,—6, 2, 4, and 1, 5, 3, 3,—1, 2, 8, 4, 3, 9, 4, 4, three little boys, lived in the city of 1, 2, 3, 4, 5, 6, 7, 8, 9. They went out one evening to play 1, 2, 3, 3, and when they returned their father (who, by the way, was a very 4, 2, 3, 3, man, and sometimes as cross as a 1, 9, 2, 8,) said to them that they could never go out to play, 6, 7, 8, 9, if they were ever so 3, 2, 4, 9, again; and he gave 4, 5, 6, (a little 6, 5, 4, 9, of a chap) a 1, 2, 4, on his head, although he was the least to 1, 3, 2, 6, 9. He began to 8, 7, 2, 8, and said he did not know what 4, 5, 6, 9,—5, 4, was. His sister 6, 2, 1, 9, 3, a lovely 6, 7, 8, 4, 2, 3, came and comforted the little fellow. Although she was a little 3, 2, 6, 9, she walked a 6, 5, 3, 9, to school, every day. MAY.

PIES.

1. Detuitrag si het isafret lobmoss chhwi gnireps morf eth olus, dan eht earth fo nam howntek onne rome trangfar. Wehil sit potennop. edituginrat, si a iedday dewe, ton noly noginisop ni isfelt, tnb greatginnimp het vrye stopherema ni chhwi ti worgs thiw tidef sprova.

2. Heret si on olary dora ot nalrengi. CHARLIE G. B.

SQUARE WORD.

1. A bird. 2. A cavity. 3. A metal. 4. To dispatch. NIP.

DECAPITATIONS.

1. Behead one animal and leave another.
2. Behead one musical instrument and leave another.
3. Behead one bird and leave another.
4. Behead an animal and leave a grain.
5. Behead part of a tree and leave a boat.
6. Behead a piece of wood and leave a fastening.
7. Behead a package and leave a beverage.
8. Behead a country and leave something unpleasant. ISOLA.

DIAMOND PUZZLE.

The central letters form a river in the United States.
1. A quarter of a cent. 2. To assign. 3. A boat. 4. A man of great power. 5. Genuine. 6. A river in the United States. 7. A county in Kentucky. 8. A county in Tennessee. 9. To traduce. 10. To lay. 11. Part of a trunk. BILLY BUTTON.

CONCEALED BIRDS, ANIMALS, FISH, AND FRUIT.

1. Charles had a very fine tool-chest.
2. He gave me a monkey-wrench yesterday.
3. It had a particular kind of screw.
4. He is always trying to do good.
5. Beer from the tap pleases many an old toper.
6. Pat routed a flock of geese on the meadow.
7. He was engaged in spearing fish.
8. He can't elope without being detected.
9. He will either have to abscond or die.
10. Cato's soliloquy has been often quoted.
11. They had permission to range around the neighborhood.
12. They used slime for mortar. JOHN M. WHEATLEY.

DROP LETTER PUZZLE.

Otighblsnheeigi,
Clighrsigadoryr;
Hmsbnsonohrvrfo
Adlntekayngo—
Tue'niedyisonnhWs
Weteelsaligsoectrs!

Thanks for letters, puzzles, etc., to E. B. E., C. M. J., Grace H. K., Annie M. M., Lydia J. R., Alice A. B., Mattie McB. A., Clara D. L., Joe, Harry G., Guy C. N., Ernest F. D., and C. D.

Send communications intended for Aunt Sue, to Box 111, *P. O., Brooklyn, N. Y.*, and *not* to 245 Broadway.

A Remarkable History.

Here is a remarkable history. It is about Stephen and the bird. You know that the savages, who do not have letters, use pictures instead, and picture writing is the only kind of writing they know anything about. This being a remarkable story, it needs both pictures and writing—or what is the same thing, types. Once there was a boy named Stephen. Stephen was a remarkable boy. Stephen had a sister—never mind what her name was—she was a remarkable sister. Stephen's sister had a bird—never mind what kind it was, it was a remarkable bird. If you don't think so, here is its picture.

STEPHEN'S SISTER'S REMARKABLE BIRD.

One day the sister was going away from home; she was afraid to leave her bird. Stephen's sister had a remarkable reason for being afraid. This was the reason.

STEPHEN'S SISTER'S REMARKABLE REASON.

So Stephen's sister made Stephen promise that he would watch the bird while she was gone. Stephen was not only a remarkable, but a promising boy, and he promised. This is the way that Stephen watched.

STEPHEN WATCHING THE REMARKABLE BIRD.

As Stephen watched, he dreamed. He had a remarkable dream—strange things happened. Some dreams come true. This is what Stephen saw at the end of his dream.

THE REMARKABLE END OF STEPHEN'S DREAM.

The Fox, the Goat, and the Carrots.

This is a fable, translated from the French. Do you know what a fable is? The word is sometimes used to mean a falsehood or untruth, but it has another and a better meaning—a short story that is intended to teach some good lesson. When your grand-parents were children, there were but few books for boys and girls, and Æsop's fables were then read by young as well as old, and very good reading they were. It is not known who wrote Æsop's fables; there was a celebrated writer of that name who lived about 600 years B. C., but it is supposed that the fables called his were written by others. La Fontaine, a Frenchman, was a writer of charming fables, and there have been others in other countries. In Æsop's fables the story is told, and then its meaning added in a "moral," but we think that the story should be so well told, that every one who reads it should see the moral without being told. We do not know who wrote this fable, but it will no doubt remind many a boy and girl of times when they have been as foolish as the fox and the goat.

Once a fox and a goat were walking together along a road, and saw a sack lying against a hedge.

"What do you think is inside that sack?" said the goat.

"I will go and see," replied the fox; and, putting his nose into the mouth of the bag, tied tightly by a cord, he shook about the bag so much that the string at last gave way, and the finest carrots one could wish for fell out.

"They are for me," said the fox, "for I opened the sack.'

"Yes," said the goat; "but I gave you the idea, and if you touch them I will tear your sides with my horns."

The fox looked at the goat's great horns and showed his teeth.

The goat, on seeing the fox's teeth, thought within herself, "I don't much like that kind of weapon."

And the fox said to himself, "I will not expose my sides to those terrible horns."

After a minute's silence the fox said: "Why do we stand looking at each other? What is the use of that? Let us see which is the stronger. See, there are two heaps of stones. You shall take one and I the other. He who shall first throw down his heap shall eat the carrots."

"Very well," said the goat. So they went to their heaps of stones.

The goat put her legs firmly together, and struck with her horns so hard as to make a great noise, but the heap did not shake.

"Ah! you do not hit hard enough," said the fox.

The goat went three steps backwards, and ran at the heap with all her might. But, crack! her horns broke!

When the fox saw that he began to skip about. "Oh, my dear friend," said he, "the carrots belong to me now!"

"Not yet," said the goat, "you have not succeeded in your task yet. If you touch the carrots, I will tear your side with the stumps of my horns."

The fox looked at the goat, and said to himself, "She has one left still, which is almost whole; she will tear my sides with it."

"Well," said he, "I will knock down my heap, then; it is nothing for me."

The fox began to dig with his fore-paws until he had made a great hole in the ground close to the heap. The stones soon fell over into the hole, but, alas! they fell on the fox and broke his left paw.

Then the two looked at one another—the one with her broken horns, the other with his broken paw.

"Run after the carrots," said the goat, with a sneer, "I will give them up to you."

"I can not," answered the fox, "my paw hurts me too much. Take them yourself."

"That is just what I am going to do," said the goat, and she ran for the sack; but neither bag nor carrots were to be seen: while they were disputing, a man had come along and carried all away.

"Alas!" cried the goat, "how stupid we have been! If we had divided the treasure, we should have kept whole—I my horns, you your paw, and each of us would have had more carrots than we could eat."

The Spring under the Willow.

BY LILA V. NORTH.

Once, a long time ago, a little boy named Charlie lived with his mother on the side of a green hill. His father had been a sailor, and was drowned in a storm at sea, leaving his wife and little boy only money enough to live on in their little cottage among the trees. Charlie was happy all the day long: he loved the trees and flowers, and the pretty wild creatures of the woods and fields were all his friends; but best of all he loved the spring under the willow. In the hottest summer weather the water was always cold, and three times a day Charlie went to fill his little pail for himself and his mother.

One day it was very hot, and the sun poured down its heat every moment, while there was no kind cloud to shield the poor earth from its rays. Toward noon Charlie took his little pail to go for the water. Out from the shade of the maples around the house he went, and down the long, bare hill-side. Charlie thought there must surely be a stone in the crown of his straw hat, it weighed so heavily, and the willow, where the spring was, had never seemed so far off. He was very glad to get under its shade at last, and to find the spring as cool and fresh, as though it had never heard of being warm. Charlie tossed off his hat, and threw himself down on the mossy ground beside the spring. The willow hung over it, and shielded it with all its long boughs from the sun, so that when Charlie looked in, all he could see at first, were the bunches of slender branches, with their long leaves, looking like the green hair of the mermaids that his father used to tell about. But after a while his eye grew accustomed to the darkness, and then he found he could see to the very bottom of the water. And hark! what was that; was it the noise of the little brook tumbling over the stones, or was it fairy laughter? Certainly it must have been laughter, for there, looking up at Charlie from the bottom of the spring, was the tiniest, brightest, merriest little man in the world. He was dressed all in green and silver, and for a cap he wore a white morning-glory, with a long willow-leaf as a feather.

"Good morning!" he called out to Charlie, laughing and nodding, until Charlie could not help laughing too.

"How did you come there?" asked the astonished and delighted little boy.

"Come here? Why, I live here. I am a water-fairy, and I own this spring," said the little man, and somehow his voice sounded like the soft, clear noise the brook made, as it ran out of the spring, and raced away over the pebbles.

"I should think you would get wet," said Charlie.

"Wet! Of course—I want to be wet; it's dreadful to be dry. Come down here, and see how cool it is."

It did look cool; the bottom of the spring was allvery sand, and the sides were white rocks. No hot sunshine found its way down there.

"Won't I be drowned?" said Charlie, hesitating.

"Am I drowned?" asked the fairy, dancing about and laughing, until he sent several little bubbles up to the top of the water. Charlie could not resist; without stopping to think twice, he jumped in. To his surprise, instead of sinking like a stone, he went down slowly and lightly, until he reached the bottom, and instead of being choked by the water, it seemed to him he had never breathed so easily before. His size, too, was greatly changed, he was now hardly as tall as the water-fairy, and was dressed in a suit of green and silver, like his. On his head was a morning-glory cap, and the fairy picked up a long willow-leaf from the bottom of the spring, and gave it to Charlie for a feather.

"Now I'll show you something worth seeing," said the merry little man, and taking Charlie by the hand, he led him through an archway in the side of the spring. Through this archway a stream rushed into the spring, and after they had ascended a steep place, down which it poured, Charlie found from whence it came. They were in a rocky cave. Oh, how beautiful it was! The walls and sides shone like diamonds, and in its center a beautiful fountain threw its clear water almost up to the roof, and from the fountain gushed the stream, which led into the spring. Charlie noticed along the sides of the cave heaps of what seemed little pearls, yet sparkling with colors, which a pearl never had.

"These are drops of dew," said the fairy. "I have been gathering them from the spray of the fountain. To-morrow look on the grass, and flowers, and cobwebs, and you will see them all."

Charlie thought he could have staid listening to the fountain for hours, but the fairy led him into another chamber, opening from the first. Here the floor was covered with little bags, and each bag was labeled with the name of a flower. White Clover, Red Clover, Buckwheat, Yellow Jessamine, Honeysuckle, Orange Blossoms, Charlie saw all these, and many more. "These are bags of honey for the flowers," said the fairy, "as soon as a flower opens, I send some one to pour a bag of honey into it. The bees know it, and learn to watch for the fresh flowers. And now I'll show you something still more wonderful." So he led Charlie into another chamber, where there were heaps of jewels of all kinds.

"These are for the fishes and insects to wear," said he.

"I never saw them have any," said Charlie in surprise.

"Ah! you don't look," said the little man, "that's the reason I brought you here."

Just then Charlie stopped suddenly, and listened a moment. Faint and far away—oh, so far away—he heard some one calling "Charlie! Charlie!"

"I must go," he said, "it is my mother."

"Oh, wait a moment," said the fairy.

"No—thank you for your kindness, but I must go," he said, and running into the cave of the fountain again, he plunged into the stream, and was carried into the spring. With all his might he leaped upward, and then a mist came over his eyes, and he knew no more, until he waked on the mossy ground, and found his mother bending over him.

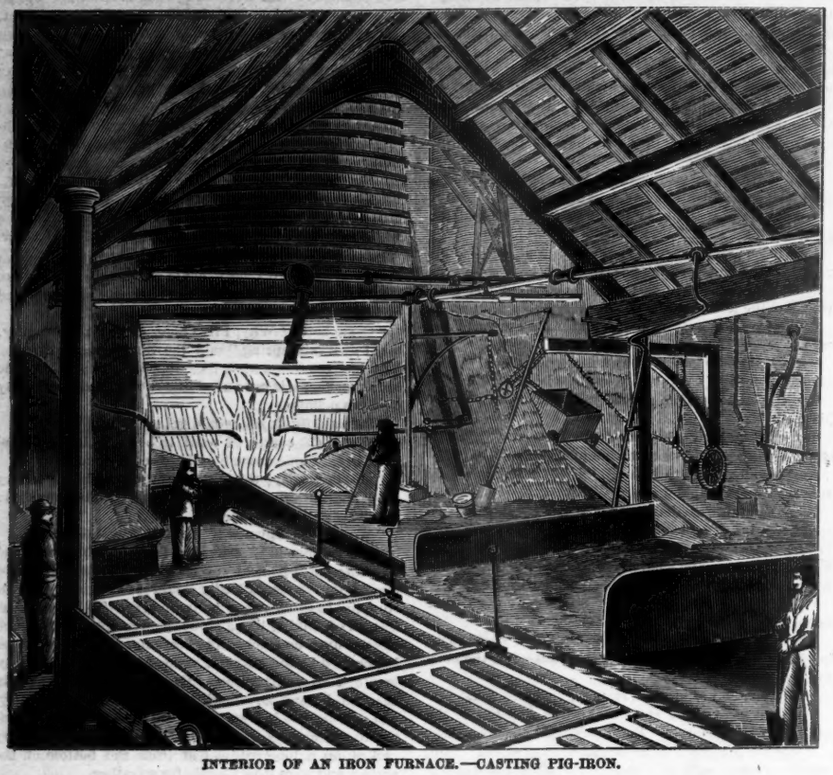
"Where's the water-fairy," said Charlie sitting up.

"Don't try to think," said his mother, "you must have had a sunstroke. Do you feel better now?"

"Oh yes," said Charlie, "but I haven't had a sunstroke, I've been down in the spring."

His mother did not believe him, but Charlie knew it

was true, for when he looked into the spring, there was his green feather at the bottom, and the next time he found a locust, he discovered an opal in its head, which he was sure was one of those he had seen in the fairy-cave when he visited the Spring under the Willow.

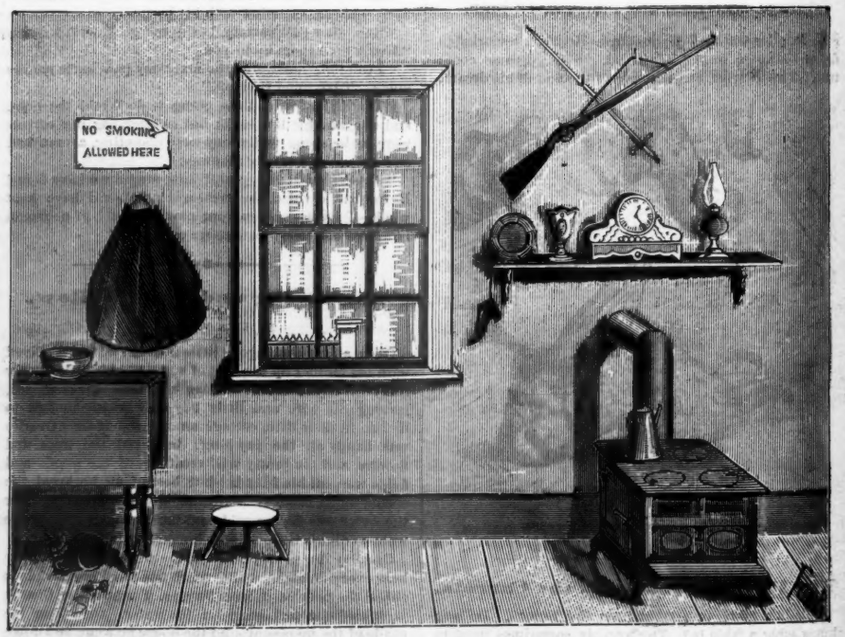


INTERIOR OF AN IRON FURNACE.—CASTING PIG-IRON.

The Doctor's Talks—About Iron and Steel.

Little did the boy think, who asked the question as to the difference between iron and steel, that he would have to read so long a reply. But a brief dictionary answer would not tell much, and when I am obliged to describe everything about it, because boys and girls are not apt to know much about chemistry, it takes a great while. Let us see how far we have reached: The iron in the ore is usually mixed with oxygen, and we separate the iron by taking away the oxygen, which we do by giving the oxygen a plenty of carbon (coal). The iron runs from the furnace where it has been separated from the ore as cast-iron, and usually the first step is to run the melted iron into rough bars, called pigs, as was described last month. Since that was printed, I have come across an engraving showing the interior of the casting shed to an iron-furnace, which I give here. You see on the left hand side the sand made into ridges with channels between them; these channels are the molds. Along one side of these there runs a long channel, which connects with these shorter ones, or molds, but to have the molds furthest from the furnace filled first, these are shut off from the long channel by gates, which are plates of iron with a handle, and look much like a spade. When the melted iron has filled the molds furthest from the furnace (a part of which you see at the rear), these gates are taken out, one at a time, to let the melted iron run into the other molds. This cast-iron is not pure, but contains, besides other matters that were in the ore, from two to five parts in the hundred of carbon, which it got from the coal. To change the cast-iron into wrought-iron, this carbon, or nearly all of it, and other impurities also, must be got rid of, which is done by burning it out; the melted cast-iron is exposed to a great heat with a plenty of air, and the carbon nearly all disappears, leaving the iron nearly pure in the form in which it can only be worked by hammering and welding. Cast-iron is brittle, hard, and can be melted, but cannot be welded; wrought-iron is tough, but soft, and cannot readily be melted, but can be welded. For many purposes a metal is needed that has all these qualities; that is tough and hard, and may be melted or welded, and this is found in steel, which is iron containing a much smaller quantity of carbon than cast-iron, and more than wrought-iron. The original way of making steel was to first make wrought-iron from cast-iron, and then turn the wrought-iron into steel by adding more carbon. A very curious process it is. A case is built of fire-brick, and in this are placed bars of wrought-iron, which are packed in fine charcoal; the charcoal being all around and between the bars, the case is closed tight, heated bright red, and kept at this heat for a week or more. At the proper time the case is allowed to cool, and the bars taken out; instead of being soft and tough, as when they went in as wrought-iron, they are now hard and brittle, and are turned into steel. Being roasted so long with the carbon, or charcoal, the iron unites with enough of it to produce these changes. Bars of steel produced in this way are uneven in quality, the outside of the bar having more carbon than the interior; so the bars are broken up and put into a pot made of black-lead (such as pencils are made of) and clay, and exposed to a strong heat; the steel melts, and is then cast into molds, and the bars thus made are of even quality all through. Steel contains from about one part in four hundred to two parts in one hundred of carbon. There are several other ways of making steel; one is by a mixture of certain different iron ores, which yield, by proper management, steel instead of cast-iron. There is what is called the Bessemer process, too difficult to describe to young people, but which makes steel so cheaply that it may be used for rails on rail-roads, instead of iron. However the steel may be made, the object is to get a mixture of iron with a small quantity of carbon. There are other substances besides carbon that alter the quality of steel, but you must wait until you get older before you can learn about these. One of the valuable things about steel is that it may be soft and tough, or exceedingly hard and brittle, according to the use for which it is to serve. If a piece of steel is heated red hot, and then allowed to cool very slowly, it will be soft, but if, when red hot, it is plunged into water or oil, it cools suddenly, and will be very hard and brittle. Another curious thing about steel is that it may be made of any desired hardness between these two points; for razors and surgeons' instruments much harder steel is needed than for saws and other carpenters' tools; this giving the steel any desired hardness is called *tempering*. The steel is first made very hard by heating it red hot, and cooling it suddenly in water or other liquid; it is then tempered by heating it to a less strong heat. Polished steel, when heated to about 430°, turns a very pale yellow, as the heat is increased it turns yellow, then with more heat brown, then purple, and finally to various shades of blue. The skillful workman knows if he heats the steel yellow, and allows it to cool, it will still be very hard; if he heats it until it is brown, and lets it cool, it will be softer, and so on; he knows by watching the color what the temper of the steel will be. You have noticed that watch springs are of a bright blue color; this color shows the temper best suited for springs; in most articles the color (which is the thinnest possible film upon the surface, caused by the action of the oxygen of the air) is rubbed off, but it is usually left upon the spring. Probably some boys, who have accidentally heated their pocket knives, and then found that they would not hold an edge, no matter how much they were sharpened, have learned something about tempering steel. There is very much that is interesting and useful to know about both iron and steel, that I have not been able to tell you; but what I have said will show you that the things that we have in such common use, as iron and steel, were only brought to their present perfection by a vast deal of labor. The boy's knife-blade, the girl's scissors and needle, if we could only trace them back, what a story they would tell! and how many heatings and meltings, roastings and forgings, have there been to produce these familiar articles. No wonder then that the savage prizes a bit of iron so highly. The Creator gives us gold in pure grains, but iron can only be had by skilled labor. Gold is barbaric. Iron and steel are tokens of civilization.

THE DOCTOR.



No. 457. A Transposition Puzzle Picture.—By transposing the letters of the objects in the above picture, you will find: 1. To hinder. 2. To burn. 3. A name sometimes given to an old inhabitant. 4. A French saloon. 5. A part of the neck. 6. A troublesome insect. 7. Troubles. 8. A toy. 9. Vehicles of thought. 10. Units. 11. A step. 12. A sail-boat. 13. Perfume. 14. To rescue. 15. A part of a flower. 16. A horned animal. 17. To perform. 18. A hard knock. 19. To warble. 20. A planet. 21. A tree. 22. Passion. 23. Articles of apparel. 24. The cry of an animal. 25. Instruments.—Now here is a chance for the puzzle readers to work.

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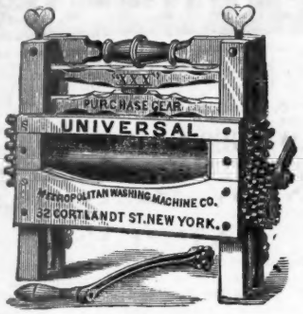

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On a Small or Large Scale.

Written and Compiled by the Editors of the American Agriculturist.

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Soldering Iron, size that tinmen use—ready for immediate use. Bar of Solder—box of Rosin, and directions that will enable you to do your mending, solder up and open canned fruit—all sent by mail postage paid on receipt of **$1.00.**

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Patent Concave Ox-Shoes.

The only forged ox-shoe made with *concavity* to fit hoof, and the best and cheapest.

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HALF GLOVES, FULL GLOVES

The best and most economical husker in use, over 200,000 sold. Made of the best calf leather, shielded with metal plates, making them last five times longer. Husk faster and easier than any other husker. Sizes for men—Ex. Large, Large, and Medium—for women and boys small—for both right and left-handed persons. Prices, pre-paid, Full Gloves $2.25, Boys, $2.00. Half Gloves $1.15 per pair. We also manufacture and recommend

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Made of best cast steel, in most approved form, and provided with straps ready for use. Unquestionably the very best husking pin in use. Price, pre-paid, 20 cts., three for 50 cts. Ask your merchant for them, or address, with price,

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Simple, Durable, Effective, and works rapidly.

This machine, improved and perfected, does its work thoroughly, picking the corn from the stalk and stripping every ear, large or small, soft or hard, completely of its husks and silk. Any ordinary two-horse power will run it.

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Corn Sheller and Cob Separator—"The Victor." First prize at Rochester and Utica Fairs, Sept., 1876, also at Ohio State Fair. It is recognized as the Standard Sheller wherever introduced. Send for Circular, before buying any other sheller. A. B. Cohu, Manufacturer, 197 Water St., N. Y.

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The Only Perfect Swivel Plow.

The Season of 1875 has proved by actual use of over 300 plows that it has no equal.

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In every Town in the United States to buy our **$2.50** and **$3.00 WORKING SUITS.** Used either for suits or overalls, according to the weather. Send length of inside seam of pants and waist measure. To clubs of **twelve** or **more** we give same terms as to agents.

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AGENTS WANTED for an article of merit wanted in every house, store, and office. So cheap that every one will buy. The Magic Chimney Cleaner, Dish Washer, Cork Puller, and Duster combined. Samples by mail postpaid, 15 cts. each; 2 for 25 cts.; 5 for 50 cts., or 12 for $1.00. Big inducements to Agents. 32-page catalogue for stamp. Write at once to the **HUB NOVELTY STORE,** 52 Kilby St., Boston, Mass.

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Sporting Rifles, Double and Single Barrel Shot Guns, Pocket Rifles, Pocket Pistols, and the noted Hunter's Pet Rifles. Send for Catalogue. **J. STEVENS & CO.,**
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65 of the prettiest Visiting Cards you ever saw, with your name neatly printed on them, sent by return mail, upon receipt of 25 cts. and a three-cent stamp. You will have samples of Glass, Marble, Snowflake, Damask, Repp, Tinted and White Bristol. The stock shall be first-class. I have some of the most particular and expert printers to be obtained in the country, and employ no inexperienced boys to turn off cheap work. No hurried or imperfect work leaves my establishment. Try them and you will be pleased. Write plainly, and give full address.

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YOUR NAME neatly printed on 40 fine Bristol Cards (7 tints) for 10 cts. and 3c. stamp; or 50 Assorted Cards (no two alike) 30c. 20 Acquaintance cards, 12 styles, 10c. Agents' outfit, 25c. CLINTON & CO., Box 49, CLINTONVILLE, CONN.

50 Visiting Cards, with your name finely printed, sent for 25c. We have **100** styles. **Agents Wanted. 9** samples sent for stamp. A. H. Fuller & Co., Brockton, Mass.

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Only the purest vegetable oils used in its manufacture. No artificial and deceptive odors to cover common and deleterious ingredients. UNRIVALLED FOR THE TOILET AND THE BATH. Used in bathing children, will prevent eruptions, keep the skin soft and smooth, contribute to health, and prevent disease. Does away with all powders, chalk or other emollients. A certain preventive of *chafing, itching, &c.*, in babies, the causes of half the crying and crossness of babyhood. Worth ten times its cost to every mother and family in Christendom; packed in boxes of 12 cakes, of 6 ozs. each, and sent free to any address on receipt of $2.50. Address **B. T. Babbitt,** NEW YORK CITY.

☞ For Sale by all Druggists. ☜

LAMB KNITTING MACHINE.

IS the **only** Machine that can knit all sizes of work, and narrow and widen it; that can **shape** and COMPLETE, without hand-finishing, seamless Hosiery, Gloves, and Mittens, or knit them in **all sizes;** or knit Ribbed, Double, and Fancy stitches for Underwear, Jackets, Shawls, Scarfs, etc. It knits over **25** different Garments. Over **100** per cent Profit in Manufacturing Knit Goods. The Farmer trebles the value of his Wool by converting it into Knit Goods. Women make **$5.00** a day with it. Agents wanted. Send stamp for Samples of work, and **reduced** Price-List. Address LAMB KNITTING MACHINE CO., at Chicopee Falls, Mass.; Cincinnati, O.; Chicago, Ill., or 922 Chestnut St., Philadelphia.

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STOVE DRESSING.

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It will do more work with less labor and expense, and give a more elegant and lasting lustre than any Stove Polish ever produced. *A stove can be dressed on delicate carpet without soiling it.* Send 10 cents for sample package.

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ENDORSED BY THE MOST EMINENT PHYSICIANS.

The Most Complete System OF PHYSICAL EXERCISE Ever Devised for Home Practice.

100,000 in use by men, women and children.

Used standing, sitting or reclining.

Hundreds of graceful movements.

For home, office, schools, hospitals.

Price List.—No. 1, for Children 4 to 6 years, $1.00. No. 2, for Children 6 to 8, $1.10. No. 3, for Children 8 to 10, $1.20. No. 4, for Children 10 to 14, $1.30. No 5, for Ladies and Children 14 years and upwards, $1.40. No. 6, for Gentlemen of moderate strength, $1.50. No. 7, used by Ladies, Children or Gents, $2.00. No. 8, for Gentlemen of extra strength, $2.50. Full set, *family use,* 1 each, (1 to 6) Two 7's and Two 8's, $16.00. Nos. 7 and 8 are fitted with a screw-eye and hook to attach to the wall or floor. A pair of No. 7, ($4.00), or 8, ($5.00), make a complete Gymnasium and Health Lift. Sent post-paid on receipt of price. Exclusive Agencies granted in unoccupied territory. Exclusive rights to sell the Pocket Gymnasium afford the largest possible returns for small investments. Its sales are nearly universal wherever it is placed before the public and its merits fully understood.

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Goodyear Rubber Curler Co.,
P. O. Box 5,156. **697 Broadway, New York.**
RUBBER GOODS OF EVERY DESCRIPTION.

Self-Propelling Chairs For Cripples and Invalids

Can be *easily* propelled, either in or out doors, by any one hav-ing the use of hands.

State your weight for illustrated circulars and styles and send stamp catalogue of prices.

Please mention this paper.

S. A. SMITH, No. 32 Platt St., N. Y. City.

Reclining Invalid Chair

ON WHEELS,

easily propelled by occupant, in or out doors. Best reclining one made. Send for circular. Exhibited at Phila., in Main Building T, 59, and made by

New Haven Folding Chair Co.,
New Haven, Conn.

THE BEST PAINT IN THE WORLD.

ANY SHADE FROM PURE WHITE TO JET BLACK, AND, AS IT IS MIXED READY FOR USE,

EVERY MAN CAN BE HIS OWN PAINTER.

The incorporation of RUBBER in our paint makes it *unequaled* by any other. It is unaffected by change of temperature, and is perfectly waterproof. It presents the finest possible finish, will not crack or peel off, and is in every way the "*Best Paint*" for either inside or outside painting, is from one-fourth to one-third cheaper, and lasts three times as long as the best lead and oil paints. The almost *unanimous verdict* of the many thousands who have used our paint is that it is *far superior* to any other paint in use.

Be sure that our TRADE MARK, (a fac-simile of which is given above,) **is on every package.**

The great popularity of and demand for our paint has necessitated the establishing of "*Branch Factories,*" as follows:

No. 506 West street, New York City; No. 83 West Van Buren street, Chicago, Ill.; No. 210 South Third street, St. Louis, Mo.; and a Wholesale Depot at Wm. King & Bro., No. 2 North Liberty street, Baltimore, Md.

SAMPLE CARD AND PRICE-LIST SENT **FREE** ON APPLICATION.

DAY'S AUTOMATIC INCUBATOR.

Neatest, simplest, best. Heat entirely self-regulating. Provides for the young chicks. Capacity, 220 eggs. Price, $50. See July *Agriculturist,* 1876. Address

DAY BROS. & CO.,
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EVERYTHING FOR THE FARM.

Seeds, Implements, Machinery, and Fertilizers. New Catalogue, 200 Illustrations, mailed on receipt 10 cent stamp. **A. B. COHU,** 197 Water St., New York.

CENTENNIAL PRESENTS FOR THE LITTLE ONES.

Crandall's Building-Blocks

Can be made into forms of almost endless variety. The blocks are put up in neat, strong boxes, and a large sheet giving various designs of buildings, etc., accompanies each box.

Price—No. 1, $2.00; *by mail, prepaid,* **$2.50. No. 3, $1.00;** *by mail, prepaid,* **$1.25. No. 4, $1.00;** *by mail, prepaid,* **$1.15.**

Crandall's Masquerade-Blocks.

Making 300 different and beautiful Combinations of Pictures, which are in very brilliant colors. They are not injured by washing, do not wear out, and afford endless amusement.

Price $1.00; *by mail, prepaid,* **$1.20.**

Crandall's Acrobats.

Full of fun and frolic, and most brilliant in costume. These are among the most fascinating and ingenious toys ever invented. The number of figures which can be made with the pieces in a single box is limited only by the ingenuity of the operator.

Price $1.00; *by mail, prepaid,* **$1.25.**

Crandall's Expression-Blocks.

With Letters on one side, Picture on the other. The Alphabet is the key to the picture which, when complete, represents the inventor in Dream Land. These Blocks are water-proof, and can be washed if soiled.

Price 50 Cts.; *by mail, prepaid,* **70 Cts.**

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These Cubes are gorgeously colored, and will make over 500 beautiful combinations or figures. They are water-proof, odorless, and durable; put up in handsome black walnut boxes; and are most attractive to both young and old—an elegant present for the little ones.

Price $2.50; *by mail, prepaid,* **$3.00.**

Crandall's Menagerie.

One of the most wonderful and amusing things ever brought out for the entertainment of children. The six animals composing the menagerie are beautifully painted, and so arranged into 56 pieces in each box, that tens of thousands of most laughter-provoking figures can be made up with them.

Price $2.00. [*Purchaser will pay express charges. Box too large to go safely by mail.*]

Crandall's Alphabet-Blocks, Red, White, and Blue.

Tasteless, odorless, and water-proof. The letters are on red, white, and blue ground. All children are pleased with them. **Price 75 Cts.;** *by mail, prepaid,* **$1.00.**

N.B.—*If postage is not remitted with the prices, as above, the blocks will be sent by express at purchaser's expense.*

Orders from the Trade will be supplied on Liberal Terms.

ORANGE JUDD COMPANY, 245 Broadway, New York.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from p. 367.

☞ Subscribe **this month for all of 1877,** and get **November and December** Numbers FREE. ☜

Winter Oats.—A Southern farmer sends the following account of four acres of red rust-proof oats, sown in the middle of November, 1875, in North Carolina. 360 bushels of cotton seed were scattered over the plot, and 9½ bushels of oats were then sown, the whole being plowed in with a light furrow. The oats grew very vigorously, and were harvested in July, yielding over 12½ tons of sheaf-oats, and more than 200 bushels of grain. The cost of seed, fertilizer, and labor, was $52; the value of the crop was $300. In March the oats were somewhat injured by the frost.

St. Louis Fair.—The sixteenth St. Louis Fair will commence on the 2nd and close on the 7th of October. $50,000 are appropriated by the Association for premiums. This fair has heretofore been remarkably successful, and the programme of the present year promises a show of equal interest to any previous one. Premiums of $3,200 are offered for cotton alone.

How many Eggs can a Hen Lay?—"W. L.," Cleveland, Ohio. That depends altogether upon the manner in which the hen is fed and kept. Hens have been known to have from 700 to 1,000 embryo eggs in the ovary, which would all have been probably developed in course of time, if the fowl had been properly cared for. A Brown Leghorn hen, 8 years old, has been known to have laid over 800 eggs, and is, we believe, still productive.

Foul in the Feet.—"S. H.," Agassiz Landing, British Columbia. The disease characterized by blisters between the hoofs of oxen, is what is known as "foul in the foot." It is the effect of mud, or wet, or filth in yards or stables, or sometimes of a disordered condition of the blood. It may be prevented by keeping the cattle dry, and in clean yards, or washing the feet, after having been necessarily fouled. It may be cured by giving a smart physicing with salts, eight ounces to a pound being used, according to the size of the animal, and by washing the feet with warm water and soap, and afterwards dressing the sores with a solution of one ounce of blue vitriol (sulphate of copper), or white vitriol (sulphate of zinc) in a pint of water. Or the vitriol may be ground up smoothly in four ounces of lard, and the mixture applied with a feather.

White Veal.—The Secretary of the Massachusetts Society for the Prevention of Cruelty to Animals, sends us some extracts from various publications, protesting against the cruel and unnecessary practice of bleeding calves, previous to slaughtering them. The *American Agriculturist* willingly joins in such a protest, but at the same time we do not believe that the public who eat the veal, are so much to blame, as the butchers, who practice the unnecessary and really injurious cruelty. Calves slaughtered upon the farm have flesh nearly as white as that sold by the butchers, and we never heard any objection made by purchasers of the veal. A popular practice in the trade is not easily set aside, and the trade themselves are the most stubborn in resisting innovations. We would suggest a legislative enactment, and its vigorous enforcement.

Remedy for Roaches.—"T. B. P.," Goldsboro, N. C. Wherever the Persian Insect Powder (*Pyrethrum*) can be procured *fresh*, it disposes of the insects in a single night. It is blown into every crack, and as soon as the roaches are touched by it, they come out and soon die. When old, or poorly kept, the powder is useless. Any druggist can get it for you. Some sprinkle powdered borax in the places which they haunt. Others take strips of cucumber peelings, of which they are very fond, sprinkle them with Paris green, and lay them on the floors at night. The strips should be taken up early in the morning and burned, and fresh ones laid down at night again. The dead roaches are eaten by their surviving relatives, who thus

fall into the same fate. Thanks for the sketch of the gun fence, which is a common one in many localities.

Weights of various Bushels.—"S. H.," Fraser River, B. C. The legal bushel is not the same in every locality, and varies according to law or custom. The most common measures are as follows: wheat and rye 60 pounds, corn 56, barley 48, buckwheat 48 to 50, oats 32, potatoes and roots, 60, clover 60 to 64, peas 60, timothy grass 44, orchard grass 12 to 14, red-top 12, blue-grass 14, lime and hard coal 80 pounds. The bushel in general use in the United States is the English or Winchester bushel, which contains 2,150.40 cubic inches, or 77¼ pounds of pure water at its greatest density, or 39 degrees. The Imperial bushel of England contains 80 pounds of water at 39 degrees, or 2,218.2 cubic inches, and is in use in the State of New York.

English Consumption of American Cotton.—It will surprise many persons who have supposed that the Southern States possess a secure monopoly of the English cotton market, to learn that American cotton is being rapidly supplanted in that country by other kinds. In 1860, out of 2,633,590 bales of cotton used in English factories, 2,241,590 bales were of American growth. In 1870, of 2,627,884 bales used, only 911,741 were American cotton. In 1860 England used only 176,668 bales of East Indian cotton; in 1870 there were 958,936 bales used, or more than were consumed of American product. The consumption of Brazilian cotton is now four times that of ten years ago, and 132,527 bales of West Indian cotton is now used, against only 6,384 bales ten years since. American cotton is no longer beyond the rivalry of East Indian cotton. But there are now in Georgia alone, over forty cotton factories, and others are building, and Georgia is a more profitable customer for Georgia cotton, than any foreign country can possibly be.

American Berkshire Record.—The Secretary of the Berkshire Swine Association, A. M. Garland, Esq., Springfield, Ill., informs us that applications for entry for the Second Volume of the Berkshire Record, will now be received. A circular containing suggestions and instructions, will be sent to applicants, also blanks for entries; copies of the first volume can be had for $3.00, postage paid. The creditable and satisfactory character of the first volume of the Record, will be a sufficient guarantee for the future volumes.

Side-Shows at Fairs.—To our notion one of the great blemishes to State and County fairs has been the various shows and mountebank venders that have been allowed within the grounds. We have seen within the enclosure of the New England fair exhibitions that we regarded as perfectly disgraceful, and had supposed that these, and other violations of propriety, were due to weakness and good nature on the part of the managers. To our surprise we find that the Berks Co. (Pa.) Agricultural Society, in their announcement for this year's fair, have a direct appeal to "Proprietors of Side-shows and Exhibitors of Natural Curiosities," offering every inducement to such to engage space on their grounds. We mention this with regret, and only cite this particular society as the first that we have known to encourage "side-shows." It is bad enough to have "Fat Women," "Snake Charmers," and "Double-headed Calves" outside the grounds, and we think that any society that can not hold successful fairs without catering to such things, had better omit them altogether.

Watermelons in Virginia.—Watermelons have been a success in almost every locality, but one grew so large in Virginia, that Justice Crutchfield had to arrest its career at 120 pounds, and send it to a station for the attention of the policemen. It was as large as a flour-barrel, and according to the account "It was a novel sight, though, to see three men eating off one slice, and to see another flaxen-haired policeman holding a piece between his legs like a bass-fiddle, and beginning at the top, trying to eat his way down.

Toads and 'Tater Bugs.—"A. H. G.," Sing Sing, N. Y., writes an account of his observations on the Colorado Beetle. What he says of the agency of the larva of the Lady-bird as a destructive agent, is well known, and we have long ago published it. Besides this he states that the common toad consumes a large number. He threw before the toad five beetles in succession, and each, as soon as the insect showed signs of life, was swallowed by the toad "quicker than a wink." We have always held the toad in great respect as an insect destroyer, and his fondness for the Colorado beetle increases our regard for it.

The Potato Bug Useful.—We are told that nothing that is, was made in vain. To be sure, there are many things of which utility is not their most conspicuous feature, and we have been some years in discovering that the Colorado beetle is useful as well as ornamental. We regard the so-called "Horse-nettle," *Solanum Carolinense*, as perhaps the worst of our agricultural weeds; though own brother to the potato, it has been repeatedly stated that the Colorado beetle would not feed upon it. We now have direct testimony from a correspondent in Fairfax Co., Virginia, that the beetles last year kept the plants so stripped of leaves that they matured no seed-balls, and came up much weaker this year. Who knows but after all the *Doryphora* may be a blessing in disguise.

Weed Named.—"R. E. S." The specimen sent is botanically *Erechtites hieracifolia*, and generally known as Fire-weed. It is one of the composite family, and springs up in great abundance in newly cleared land, especially if it has been recently burned over. It is very luxuriant where the soil is rich, growing higher than one's head, and on poor soil only a foot high. Its seeds are provided with abundant means of transportation by the winds, but it is not aggressive in cultivated grounds.

Valentine & Co., Varnish Makers, 323 Pearl St., New York, have adopted a novel method of making their products known. They issue a collection of a dozen or more silhouette engravings, of an excellence that will make them welcome to any household, with, of course, their card accompanying it.

Variegated Grape Leaves.—"V. L.," Palmyra, Wis., sends Concord grape leaves, which are quite ornamental, being yellowish with green veins. This is one of those variations, to which no satisfactory cause has been assigned, and is similar to that which in some plants is permanent, and gives them increased value as horticultural ornaments. We have seen other instances in our native grapes, and there is a variegated grape, of a species which has not edible fruit, that is permanent, and cultivated for ornament.

Breakfast Bacon.—"W. F. C.," Mar's Bluff, S. C. The bacon put up in strips, packed in canvass and known as "Breakfast Bacon," is the belly pieces of the hog, which are left after the roasting pieces or the mess pork is cut off for packing, cured in the usual manner and smoked. The bacon is thin and streaked with lean and fat, and the best of it comes from the Berkshire pigs, which have deep sides, yielding a large proportion of bacon. When home cured the pickle should have four ounces of sugar to every pound of salt used, and the smoking should be done with hickory brush or corn cobs.

Corn Husks.—"S. F.," Glenloch, Pa. The yield of dry corn husks from an acre of ground will be very variable. We have not measured it, but should not estimate it at more than 200 lbs. at the most. The husks may be baled and shipped as they come from the corn husking machine; the cleanest and best husks of course will sell at the best price.

Milk Mirror.—"W. W. W.," Ft. Madison, Iowa. The "Milk Mirror," or "escutcheon" in cattle is that growth of hair upon the back and inside of the thighs which, instead of lying smoothly downwards, points upwards and makes several curls at the parts where the direction of the hair is changed. The shape and extent of this upward growth of hair has been supposed to denote a special aptitute for producing milk. A book has been written on the subject entitled "Guenon on Milch Cows," in which the author gives his observations and deductions. In male animals the milk mirror is held to denote hereditary tendency to transmit milking propensities to the produce.

Sowing Steeped Seed.—"Reader," Richmond, Va. It is not proper to steep the seed so much as to soften it. All that is necessary is to use enough liquid to reach the covering of every grain and destroy any adhering spores of smut or rust, or to immerse the seed in the solution used only so long as will insure contact. If left for 24 hours before sowing the seed will be dry enough to sow with the drill. If it is made so wet as to adhere together, the seed should be sprinkled with dry lime, and may then be sown by hand.

Red Water in Cattle.—"A Subscriber," Greenville, Miss. The disease which has for its most marked symptom a highly colored urine, from which it takes the common name of "red water," is usually occasioned by derangement of the liver. This may be caused first by indigestion, as it is always accompanied by impaction of the manyplies or third stomach. It is also a marked symptom of what is known as Texan or Spanish fever, and is then also accompanied by impaction of the stomach. In this latter disease the liver and spleen are both extensively affected. The original cause may be an excess of food that is indigestible and unnutritious or acrid and irritating. A cure is difficult. The first remedy is a saline purge administered with copious addition of tepid water, such as 12 to 16 ounces of Epsom salts with an ounce of ginger. This may be followed with an ounce of hyposulphite of soda, daily, in the morning, and one ounce of salt and one dram each of sulphate of iron, ginger, and saltpeter, given in the evening for a week or ten days. Copious and frequent drinks of linseed tea should be allowed. In giving medicine to cattle, it should be poured slowly down the throat from a drenching horn or a tin vessel made in the shape of a cow's horn, but much larger at the base. Dadd's American Cattle Doctor is a useful book for every one who keeps cattle, sheep, or pigs. The new edition, 8vo., costs $2.50.

Composition of the Banana and Sweet Potato.—Some recent analyses made by M. Corenwinder of the banana and sweet potato, have given the following results. Bananas, when green, contain a large proportion of starch, which, when ripe, becomes converted into cane sugar; this latter in time is converted to a considerable extent into glucose. The composition of fresh and stale bananas are given as follows:

	Fresh.	*Kept for 18 days.*
Water	72.45	79.55
Cane Sugar	15.90	2.84
Glucose	5.90	11.84
Nitrogenous Matter	2.13	2.14
Cellulose, Pectine, etc.	2.58	2.58
Mineral Matter	1.02	1.02
	99.98	99.97

The composition of two samples of sweet potatoes was as follows:

	No. 1.	*No.* 2.
Water	86.45	69.10
Sugar	3.05	2.78
Glucose	.98	.75
Starch	8.56	14.72
Cellulose, Pectose, etc.		10.11
Nitrogenous Matters	.39	1.20
Mineral Matters	.55	1.32
	99.98	99.98

Muck from Long Island.—"S. M.," Manor, L. I. A sample of muck from Long Island consists largely of roots of grass and sedges, with partly decayed stems and leaves. This muck, or partly formed peat, would make an excellent absorbent in the stables, pens, or yards, and if mixed with fresh lime when first dug, would rot quickly and make a valuable fertilizer.

The Hardin System of Setting Milk.—"E. C. B.," Newtown, Conn. For a small dairy of 10 cows we would choose the Hardin plan of setting milk in preference to a dairy house and ice house connected with it. The former would be much cheaper and more economical. So far the experience with the Hardin refrigerator has been highly satisfactory.

A String of Questions.—"J. H. T." All your questions about sheep are answered in "The Shepherds Manual," by H. Stewart, price $1.50. To learn all you want to know you had better study that book. As an addition to stable manure, wood ashes and plaster, being probably most available, would be best to restore run down land. To use up old straw stacks spread them thinly over the meadows or fall grain fields, or more thickly over stubbles, and plow it in in the spring. A leaky roof may be made tight by covering it with Johns' roofing cement. To fit up an ice house see the *American Agriculturist* for December, 1875.

East Tennessee.—"J. B. C.," Berlin, Wis. East Tennessee is a mountainous country and consequently much cut up into narrow valleys, rocky hills and table lands. The climate is healthful and the winters are shorter and milder than in Wisconsin. Like every other country it has its drawbacks and advantages, its variety of soil and its contented and discontented people. Land is cheap in places, but good farms, well located, are no cheaper than similar farms in Wisconsin.

Why not Grow more Barley?—The successful growth of barley is only possible with good farming, just as large crops of roots need the best culture. To admit that one cannot grow barley is to admit himself a poor farmer. Our poor farming is then the reason why seven million (7,000,000) bushels of barley are imported into the United States every year. Barley is certainly a crop subject to much risk in marketing, but there is no better feed for horses; when ground it is excellent feed for cows producing rich milk; it is probably the best food of all for poultry, and when barley meal is mixed with boiled potatoes and fed to pigs, it makes the very best flavored pork more rapidly than any other food we have used. With all these advantages why not grow more barley?

Butter Making.—"H. T. R.," Montgomery Co., Pa. Willard's "Butter Book," price $1.00 and

his "Dairy Husbandry," price $3.00, give full information about dairy matters, including choice of cows and their general management. It would be well for you to procure and study these books. To tell in full how to make butter and cheese requires more space than we can give.

Farm Machinery in California.—"J. L.," Ipswich, Mass. It would be a loss of money to purchase farm machinery here to take to California, as whatever is wanted can be readily procured there. Besides it would be injudicious to purchase any thing at all, until it is known exactly what will be wanted there.

Fruit Raising in California.—"Six Young Farmers." Persons desiring to go to California together, had better send one of their number, upon whose discretion and judgment they can rely, to the chosen locality, to see it before they decide upon removing. If disappointed, the loss to the party would be trifling, compared with the possible ruin of the hopes that had been formed, and the cost of six persons going and returning. There is much mistaken enthusiasm in regard to fruit growing in California; it is a very risky business, and can only be moderately profitable even where entire success is met with, as the home demand is limited and transportation to Eastern markets very expensive, and often attended by loss.

Breeding a Young Mare.—"W. W.," Belleville, Ontario. A mare three years old may be permitted to breed without injury, if she is well cared for and not worked, but it is over-young, and only advisable in exceptional cases.

Value of Porgie Scrap.—"F. H. D.," Lowell, Mass. The value of fish scrap depends greatly upon its condition of dryness. If practically dry, it is of course worth much more than when saturated with water as it comes from the oil press. Mr. William Clift, in an address made at a meeting of the Conn. Board of Agriculture, in 1873, stated that he had used the dried scrap sold at $40 a ton, and considered it worth two-thirds as much as guano, which was then selling at $90 a ton; or $60 a ton. The raw scrap, very nearly dry, but not ground, is worth in the market from $20 to $25 a ton.

Book on Diseases of the Horse.—"G. W. W.," Wilmington, Del. Dr. Dadd's Modern Horse Doctor, is a very useful book on diseases of the horse; Dadd's American Reformed Horse Book, is a more comprehensive work. The price of the first is $1.50; that of the second is $2.50, by mail from this office.

Prices of Grain at Different Months.—The course of the market for wheat at different seasons of the year, is just now a very interesting matter for consideration. If there is a period when the best average prices are made, and this is the most convenient time for disposing of the grain, it is important to know when that season occurs. Although we would not accept the responsibility of advising any person when to sell his crops, yet it is safe to give trustworthy figures from market reports, which carry unquestionable weight with them. As we have frequently stated, our own chosen plan has been to sell as soon as the produce was ready for market, and we have been satisfied with this course. As a corroboration of the wisdom of this method, we give the following average prices of wheat per 100 pounds, for the different months during 10 years past in Liverpool; prices here of course being regulated by those there; as follows, January, $2.90; February, $2.80; March, $2.78; April, $2.72; May, $2.77; June, $2.77; July, $2.73; August, $2.81; September, $2.90; October, $2.95; November, $2.95; December, $2.94.

Fertilizers for Wheat.—"J. M. W.," West Philadelphia. The most active fertilizers for wheat at this season are Peruvian guano and nitrate of soda; but it is not advisable to use these now, except in small quantity, as they are very soluble and quickly washed away by the fall rains. 100 lbs. of either are sufficient at this time, and an equal quantity may be used in the spring.

Cure for Ringbone.—"J. L. T.," Thomastown, Ohio. As this affection in the result of several distinct causes, and in each case a different method of treatment is required, it is hardly possible to give any precise directions. Ringbones occur in consequence of constitutional disposition; rheumatic affections; defective nutrition; injuries from concussions, blows, or accidents, and the result from any of these may be inflammation of the membranes covering the bones, leading to deposit of bony mattter, or direct abnormal bony growth. Thus the usual remedy, blistering, frequently makes the disease worse. No one can give a reasonable method of cure without knowing the history of the case. It is safest to apply to a veterinary surgeon, or let the horse alone, using cold water bandages until the ringbone is fully formed, when the worse that can happen is a stiff joint.

Calves in a Hog Pasture.—"M. F. P.," Champaign, Co., Ill., states that he had some calves of pure and ⅞ Durham blood, which he allowed to run during the day in a timothy pasture in which 40 head of hogs were kept, and where there was a prairie pond. The calves soon had a cough, and scours, and diarrhœa, passing what seemed to be pure milk, and some of them died. They laid down naturally, with the head stretched out, resting on the lower jaw, and seemed in great pain, breathing short and grunting at each breath. These calves probably were affected with worms in the throat and bowels, which would cause the cough and diarrhœa. The disease is known as "hoose or husk," and was without doubt occasioned by the stagnant water of the pond and the presence of the hogs, from which the eggs of the parasites were obtained. The method of preventing the trouble is simple. Keep the calves where they have pure water and clean grass, and away from hogs. The cure is not easy. Salt and turpentine in small quantities are the only remedies that have been found effective, but it is very difficult to reach these troublesome parasites.

Color of a Berkshire Pig.—"Subscriber," Baltimore, Md. As now bred the Berkshire pig is black, blue-black, or a sort of deep plum color; with all the feet and the center of the face, but no other portion of the body, white. If a few white or sandy hairs appear on one of the shoulders or side it is an objection, but not a disqualification. That is simply a breaking out of the original marking of the old Berkshire from which the present improved race has descended. As a breeder we would, however, not use nor keep any animal for breeding, that showed the least variation from the highest present standard of marking.

Wages of Broom Makers.—"T. S." Clinton, La. The wages of broom makers are from $3 weekly to boys and girls up to $12 weekly for experienced workmen. In country places it would be a very easy matter for a family to make several dozen brooms with such machinery as a handy man could construct for himself, during the leisure hours of winter, and dispose of them to the stores. The handles can be made at any turning shop out of soft maple, white birch, or willow. The timber must be sawn into plank and thoroughly seasoned, being piled so as to dry perfectly straight.

Additional Fairs.—*Pennsylvania*, Bucks Co., Doylestown, Oct. 3-6; Washington Co., Burgettstown, Oct. 3-5.—*Maryland*, Carroll Co., Westminster, Oct. 2-8; Md. Jockey Club, Pimlico, Oct. 24-27.—*Ohio*, Central Ohio, New Cornerstown, Oct. 10-13; Portage Co., Randolph, Oct. 6-7. For others, see last month's paper.

"Science Applied to Farming," Correspondence.

German Potash Fertilizers.—"F. K.," of Conn., asks about the chemical composition of potash salts. The basis of potash compounds is the element *Potassium*. This combined with oxygen forms potassium oxide, or potassa, or, in familiar language, potash. The same term, potash, is also applied to two other potassium compounds. One, which may be considered as a compound made up of potassa and water, is known in the chemical laboratory as potassium hydrate, and in common language as caustic potash. The other is a compound of potassa with carbonic acid, and is commonly called carbonate of potash. The ordinary potashes and pearlashes prepared from the lye of wood ashes are more or less impure carbonate of potash. Potassium combined with chlorine forms potassium chloride, commonly called chloride of potassium or "muriate of potash." Potassa united with sulphuric acid forms potassium sulphate, or sulphate of potash. By adding to ordinary potash lye from ashes a proper amount of sulphuric acid, and boiling the liquid down, we might, with proper care, obtain a solid substance, which would be a sulphate of potash. If we were to use hydro-chloric (muriatic) acid instead of sulphuric, we should obtain a chloride of potassium or muriate of potash. Other elements as well as potassium combine with sulphuric acid and chlorine to form sulphates and chlorides. Sodium chloride is common salt. Sulphate of soda (Sodium sulphate) is known as Glauber's salt, and sulphate of magnesia as Epsom-salts. The German potash salts consist of potassium chloride and sulphate, mingled with more or less of the just named compounds.

Sulphates and Muriates of Potash.—"F. E.," of Conn.: It is customary to reckon the potassium of these salts as "actual potash." In the sulphates this term expresses the amount of potassium oxide, potassa, or potash present. In the muriates it represents the amount of potash which the potassium would make if it were combined with oxygen instead of chlorine.—100 lbs. of pure sulphate of potash contains about 54 lbs. of "actual potash." 100 lbs. of sulphate of potash are therefore said to be equivalent to 54 lbs. of actual potash, and vice versa, 54 lbs. of potash in the sulphates are reckoned as equivalent to 100 lbs. of sulphate of potash. In the "muriates" 100 lbs. of chloride of potassium are equivalent to about 63 lbs. of potash and vice versa.

Grades of Potash Salts and Prices.—"J. R. F.," Maine: In the *American Agriculturist* Market reports, under the head of "Prices of Fertilizers," will be found a quotation, "Chloride of Potassium (muriate of potash), 80 p. c." Where chlorides are to be used, this brand is decidedly to be recommended. It is, so far as I have seen, almost always of good quality. It contains generally from 80 to 85 per cent. of chloride of potassium, the residue being mostly common salt. At 80 per cent., 100 lbs. would contain 80 lbs. of potassium chloride, which would correspond to about 50 lbs. of actual potash (80×63, see above.) At $3 per 100 lbs for the muriate, the actual potash would cost 6 cents per pound ($3÷50.) Of the sulphates, the higher grades contain from 55 to 80, and in some brands over 90 per cent. of sulphate of potash, the residue being mostly sulphate of soda and sulphate of magnesia. I have noticed the 80 per cent. sulphate offered in New York at 3½ cents per lb. in small lots, and at $60 per ton in lots of one ton or more. 100 lbs. of this would contain 80 lbs. of sulphate of potash, corresponding to about 43 lbs. of actual potash (80×54). At $3 25 per 100 lbs. the actual potash would cost about 7½ cents per lb. It is an unfortunate fact that the sulphates of potash not unfrequently fall below the standard on which they are sold, both as regards the total amount of potash and the amount of sulphate—more or less being in the form of chloride. Several cases of this sort have been brought to the attention of our Experiment Station. In each the American importer had been deceived by the representations of the agents or chemists on the other side of the Atlantic.

Lower Grade Potash Salts.—In the price list referred to are mentioned "German Potash Salts, 25—35 per cent. This is a very indefinite expression. There are brands advertised by the Stassfurt manufacturers of about these grades in which the 25—35 per cent. refers to sulphate of potash, in which form the potassium is claimed to occur. The residue is mostly common salt, with more or less magnesium chloride and sulphate. Some of the articles of these grades are simply calcined kainit, that is to say, kainit which has been subjected to a high heat. By this process the water is expelled, and part of the chloride of magnesium decomposed, the objectionable chlorine being to some extent driven off. I think it is very questionable whether any potash salts below the grade of 30—33 per cent. sulphate (16—18 per cent. potash) will be economical as potash fertilizers on this side of the Atlantic.

Kainit.—"J. C. W.," Maryland: The mineral "kainit," which occurs abundantly in the contiguous mines of Stassfurt and Leopoldshall, is a compound of sulphates of potash and magnesia, chloride of magnesium and water. As mined and sold it is contaminated with more or less common salt. Circulars from the manufacturers at the Stassfurt mines put the unmanipulated kainit at from 17 to 25 per cent. sulphate of potash. Considerable quantities of kainit are sold in this country under the name of "Genuine Leopoldshall Kainit." The average composition of the kainit as sold from the Leopoldshall mines is stated by good German authority at 25 per cent. sulphate of potash, 14 per cent. sulphate of magnesia, 14 per cent. chloride of magnesium, 33 per cent. chloride of sodium, and 13 per cent. water. A sample of Leopoldshall kainit sold to farmers in this State at $30 per ton, showed just about this composition on analysis at our laboratory. At the price mentioned, the potash (13.8 per cent.—278 lbs. to the ton) came to about 11 cents per pound. Another sample of the same brand contained a smaller percentage of potash. A specimen of "kainit" analyzed by Prof. Storer gave 10½ per cent. of actual potash. At $40 per ton, the price at which it was sold in Boston, "each pound of real potash would come to rather more than 18 cents, to say nothing of the cost of handling the 1,600 lbs. of useless matter in each ton of the fertilizer, or of the risk that some of the extraneous matters (sodium and magnesium salts) might actually injure the crops to which they were applied."

Analyses of potash salts by Prof. Johnson, chemist of the Connecticut Board of Agriculture, and by Prof. Goessmann, State Inspector of Fertilizers for Massachusetts, agree entirely with Prof. Storer's and ours, in showing that a large amount of the German potash salts imported into this country are of the poorer grades. This is a "curious evil which needs to be known—and to be corrected." As long as farmers will buy low-priced potash salts and other fertilizers because they are "cheap," and pay no regard to the actual quality, they must expect to get poor wares at dear rates, and have poor success in using them.

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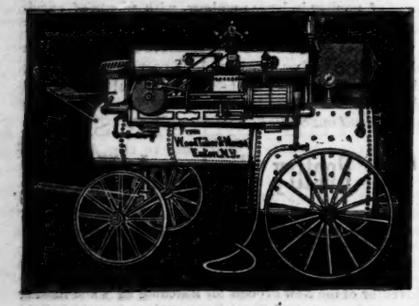

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